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AN OVERVIEW OF KWERBA VERB MORPHOLOGY

JAMES A. DE VRIES
SANDRA A. DE VRIES

1. INTRODUCTION

The Kwerba language[1] is spoken by approximately 1500 people in north-central Irian Jaya, inland from the coastal town of Sarmi in the Pantai Barat district (*Kecamatan*) of the Jayapura regency (*Kabupaten*).[2]

The language has been tentatively classified by Voorhoeve (1975:400) as part of the Dani-Kwerba Stock, Northern Division, of the Trans-New Guinea Phylum[3] (see also Wurm and Hattori, 1981; and the *Index of Irian Jaya Languages*, Silzer and Clouse ed. 1991: 25,59). Closely related languages include Nopuk, Bagusa, Kauwerawec, and Airoran (Silzer and Clouse 1991:25). Kwerba itself is composed of three main dialects: Kwerba, Airmati-Sarje, and Airmati-Sarma. Sasawa and Segar are also dialects of Kwerba. This paper focuses on the Kwerba dialect spoken in the village of Aurimi.

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1 We would like to express our gratitude to Yakobus Serikenam, Sardis and Yoel Samokari, and many others who have patiently been teaching us their language, and answering our many questions. We would also especially like to thank Kenneth Gregerson for his comments on a very early draft of this paper and Linda Jones for her comments on more recent drafts.

2 The Kwerba language is being studied under the auspices of the Universitas Cenderawasih and the Summer Institute of Linguistics (UNCEN-SIL) Cooperative Project. The language is spoken in the interior of Northern Irian Jaya, Indonesia, between the Memberamo and Tor Rivers.

3 Voorhoeve (1971:66-70) initially included Naidbedj (a former village of the Airmati-Sarma dialect of Kwerba) with the Upper Tor River languages in the Tor stock (footnote 2 p.66) of the North Papuan Phylum. Later, however, Voorhoeve (1975:400) tentatively classified the Kwerba family of languages as forming a part of the Northern Division of an united Dani-Kwerba Stock within the Trans-New Guinea Phylum. Wurm (1982:149) followed this tentative classification (see also Wurm and Hattori 1981; and the *Index of Irian Jaya Languages*, Silzer and Clouse ed. 1991:21,59). Although there are a few cognates between the Great Dani Family and the Kwerba Family, there are many cognates between the Kwerba family and the Upper Tor languages. More complete word lists that have been taken over the last few years indicate that there is a lexical cognate relationship of about 24% between the Kwerba and Berik languages. To date, there has been very little comparative work done on the Northern Division of the Dani-Kwerba stock. Further comparative research needs to be undertaken with the data that is now available. The possibility that there might be a stock level relationship between the languages of the Northern Division with the Upper Tor Languages needs to be investigated. Voorhoeve (1975:411) classified the Tor languages as being part of the Tor-Lake Plain Stock of the Northern (or Border-Tor-Lake Plain) subphylum level Super-Stock of the Trans-New Guinea Phylum (see also Wurm 1982:191ff.).

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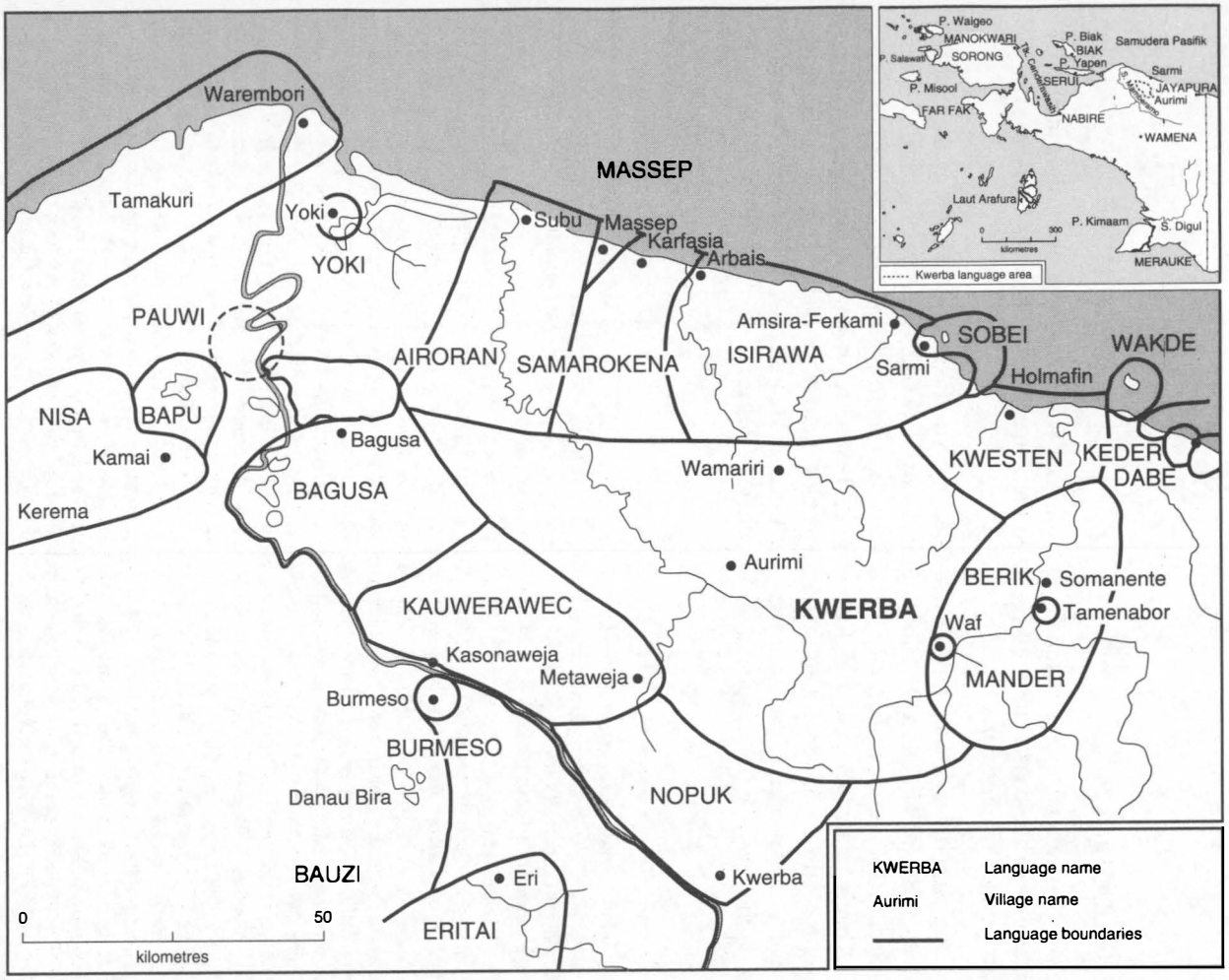
P. Waigeo
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BIAK
Samudera Pasifik
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Sarmi
SERUI
JAYAPURA
P. Misool
Aurimi
FAR FAK
NABIRE
WAMENA
Laut Arafura
P. Kimaam
S. Digul
kilometres
MERAUKE
Kwerba language area
Warembori
Tamakuri
Yoki
YOKI
MASSEP
Subu
Massep
Karfasia
Arbais
PAUWI
AIRORAN
SAMAROKENA
ISIRAWA
Amsira-Ferkami
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SOBEI
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KAUWERAWEC
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Metaweja
MANDER
Burmeso
BURMESO
Danau Bira
NOPUK
BAUZI
Eri
Kwerba
ERITAI
0
50
kilometres
KWERBA Language name
Aurimi Village name
Language boundaries

Like many other non-Austronesian languages of the island of New Guinea, Kwerba expresses precise meanings by the process of agglutination (Foley 1986:12) and the use of verbal auxiliaries.

The major constituents of verbal sentences are: SUBJECT, OBJECT, INDIRECT OBJECT and VERB. Nominals have post-clitic case markers. Although these nominal case markers allow some syntactic freedom in word order, the major constituents usually occur in a SOV pattern. These may occur with the peripheral constituents LOCATION, TIME and INSTRUMENT in the positions indicated in Figure 1.[4]

---

4 The following is a list of symbols and abbreviations as used in the examples:

1PL	first person plural subject	MUL	multiple action
2PL	second person plural subject	NCPROG	noncompletive progressive aspect
3PL	third person plural subject	NEG	negative
ABL	abilitive modal	NEGF	negative future mood
ADV	adverb	NEGP	negative past mood
AUG	augmentative size (object or intransitive subject)	NG	negative agreement
AUX	auxiliary	NITR	protracted noniterative habitual aspect
CER	certaintude (emphatic modal)	NOM	nominaliser
CL	compound link	NONC	noncompleted progressive aspect
DAT	dative	OBJ	object position
DDF	deictic of definiteness	PERF	perfect aspect
DF	definite	PERM	permissive modal
DIM	diminutive size (object or intransitive subject)	PL	plural
DIR	directional	PRES	present tense
DIS	distal action	PRFV	perfective aspect
DLEV	different level	PROG	general progressive aspect
DU	dual (subject or object)	PROH	prohibitive mood
DVD	deictic of very definiteness	PROX	proximal action
EXH	exhortative (suggestive imperative) mood	PRPF	present perfective aspect
FAR	far distance action	QM	question marker interrogative mood
FP	far past tense	RBK	recent background information subordinator
FPBK	far past background information subordinator	RL	realis status
FUT	future tense	RP	recent past
GSUB	general subordinator	S	subject
IMM	immediate past tense	SG	singular subject
IMPP	polite imperative mood	SID	side action
IMPS	strong imperative mood	STAT	stative aspect
INCP	inceptive aspect	TADV	time adverb
IND	indefinite	TIME	time
INS	instrument	TR	transitional auxiliary *-ra*
INT	intent modal	TSUB	time subordinator
IO	indirect object	UNFIL	unfulfilled intention modal
IRR	irrealis status	V	verb
ITR	iterative habitual aspect	VDF	very definite
LOC	locatives	?	unknown, uncertain gloss

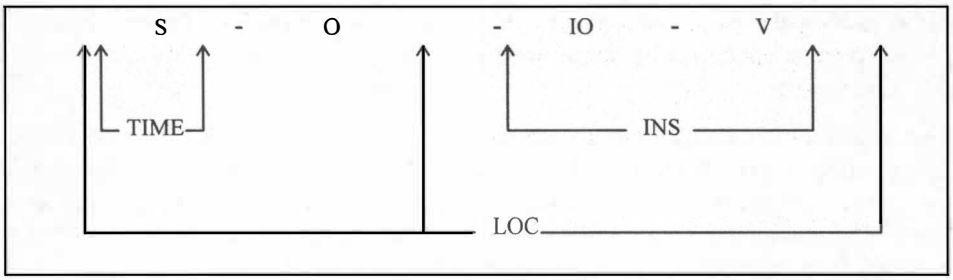

FIGURE 1: KWERBA CLAUSE STRUCTURE

The following examples[5,6] illustrate some of the variants of the major clause types:

(1) Transitive: TIME-S-O-V
Maramarion co ukwabo kwa awaric.
yesterday I dog PRFV see
Yesterday I saw the dog.

(2) Transitive with Instrument: S-O-V-INS
Co kamasabo bona kwiem barasi-awe.
I cassowary TADV cut knife-INS
I cut the cassowary with a knife.

(3) Intransitive with Locative: S-V-LOC
Ninamoraba wïre batanyam ïraua-bar.
child PROG runs field-there
The child is running in the field.

(4) Bi-Transitive: S-O-IO-V
Co tabunabo ïnun-te cara entïs.
I axe him-DAT PERF give
I have given the axe to him.

Other clause types are stative and equative:

(5) Stative:
Masua-ma nokonam.
cloth-DVD red
This cloth is red.

---

5 The phonemes of Kwerba are: a, b, bw, c{č}, e, i, ï{ɪ}, k, kw, m, mw, n, ng, ny, o, r, s, t, u, w, y, ai, au, oi, eu. For a phonemic analysis see Silzer 1976.

6 Examples vary as to the degree of detail shown when affixation on the verb is in focus in the discussion. In some examples the complete constituent structure of the verb is shown. If the surface form of the verb differs from the underlying structure, then the former is given on the first line of the example. The underlying structure is then presented on the next line. Phonemes that are assimilated by morphophonemic processes are surrounded by parentheses in the examples.

(6) Equative:
Caba com taman.
that mine house
That is my house.

2. VERB PHRASE

The VERB (V) forms the nucleus of a verb phrase (VP). There are three meaningful segments (slots) in the VP. Although the slot preceding the V is not an obligatory constituent of the VP, it is almost always filled by an auxiliary (AUX) or an adverb (ADV), but not both. Optionally there may also be a negative (NEG). The VP is summarised as follows:

VP = ±{ADV} + V ±NEG
{AUX}

Aspect, mood and mode are indicated by words that occur in the AUX slot preceding the verb. It is important to note that these separate categories do not usually co-occur in Kwerba. In the occasional instance when there is no aspect, mood, modal or verbal adverb, the pre-verbal slot is usually filled by a transitional syllable *ra*. *Ra* is a weakly stressed syllable attaching itself as a postclitic to the word preceding the verb. This is the case regardless of whether the previous word is a modifier within the verb phase or whether it is a nominal. In certain situations, such as when the preceding word ends with an unstressed syllable, the *ra* tends to be absorbed and is not pronounced.

(7) *Co bar bo-ra tï tïni*
I there that-TR think I foot-with-TR go
Then I thought, I will go on foot.

2.1 ADVERBS

Since adverbs are not the focus of this paper, we will mention only a few of the common ones. The adverb *bona* 'at that time' signifies that the event occurred at the same general time as the previous event. It can occur with either the realis status or irrealis status, as in the following:

(8)a. *Co bona (a)-kot-rï-s.*
I TADV SG-cut-AUG-RL
At that time I cut it. (with realis)

b. *Co bona (a)-kot-ri-m.*
I TADV SG-cut-AUG-IRR
At that time I will cut it. (with irrealis)

The adverb *mate* indicates 'until':

(9) *Anaba barukwe inyo mate banokw.*
people all fear till become
All the people became afraid.

The adverb *ori* preceding the verb indicates that the subject almost executed the action. This adverb must co-occur with the present tense and the realis status.

(10) *Co ori b-itamon-Ø.*
I almost PRES-fall-RL
I almost fell down.

2.2 FINITE VERB

The INDEPENDENT FINITE VERB itself is fairly complex, as shown by Figure 2.

+TEMPORAL DEIXIS #1	+SUBJ AGREEMENT	+VERB STEM	±OBJ MODIFIER	±SPATIAL DEIXIS	+TEMPORAL DEIXIS #2	±BACKGROUND MARKER
TENSE				LOCATION DIRECTION	STATUS (REALIS vs IRREALIS)	
+ Obligatory Slots	± Optional Slots					

FIGURE 2: FINITE VERB STRUCTURE

The VERB STEM is the core. It is preceded by the SUBJECT AGREEMENT MARKER, and followed by the OBJECT MODIFIER. Following the object modifier is the spatial deixis, which consists of LOCATIONALS and DIRECTIONALS as suffixes. TEMPORAL DEIXIS consists of TENSE which occurs as a prefix and STATUS which occurs as a suffix. The final position can be occupied by a BACKGROUND MARKER.

The DEPENDENT VERB consists of an independent verb with a subordinator attached as a final suffix.

Dependent Verb = + Independent Verb + Subordinating Marker

As an example of an independent finite Kwerba verb, consider the following sentence:

(11) *Co icabo wïre bakotararianam.*
Co ic-abo wïre b-a-kot-ara-ri-an-am.
I wood-obj.marker PROG PRES-SG-cut-MUL-AUG-DIS-IRR
I wood-OBJ am cutting.there
I am cutting a piece of wood over there.

The verb phrase *wïre bakotararianam* may be further analysed as follows:

ASPECT AUXILIARY	TEMPORAL DEIXIS	SUBJ.NO. MARKING	ROOT	OBJ.NO. MARKING	SPATIAL DEIXIS	STATUS
General Progressive	Present Tense	singular	'cut'	multiple action-pl.obj.	distal	irrealis
wïre	*b-*	*a-*	*kot*	*-ara-ri*	*-an*	*-am*

FIGURE 3: ANALYSIS OF AN INDEPENDENT FINITE VERB

3. VERBAL AUXILIARIES

In the remainder of the paper, we will sketch an outline of the systems that underlie this structure. The order of presentation of the various parts of the verb will be as follows: aspect, mood, modals, temporal deixis of tense and status, subject marking, object marking, spatial deixis of location and direction, verb stem, subordination, backgrounding, and nominalisation.

3.1 ASPECT

Aspect refers to the 'contour' or 'shape' of an event through time. Aspect contrasts with tense, which 'locates' an event in time.

In Kwerba there are a number of optional aspect auxiliaries which reflect various fine-grained distinctions. These aspect auxiliaries occur immediately preceding the verb. There are three broad aspectual categories in Kwerba: perfect, perfective, and imperfective. Further, there are a number of subcategories within the imperfective. The aspectual system is represented in the following two diagrams.

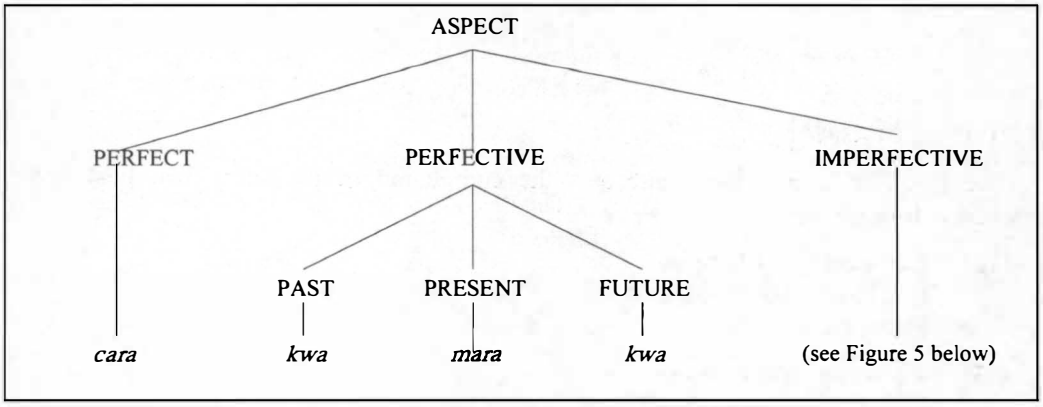

FIGURE 4: OVERALL SCHEMA OF KWERBA ASPECTS

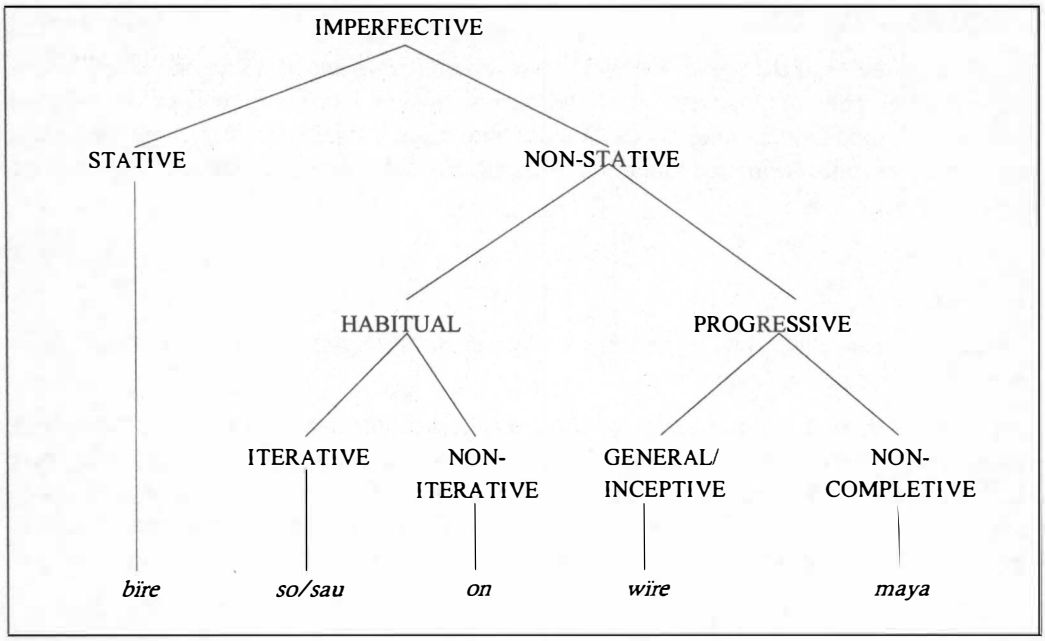

FIGURE 5: KWERBA IMPERFECTIVE ASPECT

3.1.1 PERFECT ASPECT

The PERFECT aspect *cara-* indicates the completion of an action that has current relevance, for example:

(12) *Co cara (a)-kot-ri-s.*
I PERF SG-cut-AUG-RL
I have cut it.

(13) *Co cara (a)-nan-Ø.*
I PERF SG-eat-RL
I have eaten.

3.1.2 PERFECTIVE ASPECTS

PERFECTIVE is distinct from perfect aspect. The nature of a perfective is to refer to an event in a holistic manner. The event is viewed in its entirety but not expounded on. In Kwerba the past perfective is *kwa*:

(14) *Nino beno bir ec-e-sar-ara-ri bar kasano kwa warian.*
we from in RP-1PL-enter-MUL-AUG-RL there bananas PRFV cooked
From there we entered (into the house), there (he) cooked bananas.

Nino bo kwa ec-e-nan-Ø.
we that PRFV RP-1PL-eat-RL
We ate them (the bananas).

Actually *kwa* is not just past perfective. Since it can also refer to events that will occur later, it may be analysed as a non-present perfective. In the following example *kwa* has a future perfective meaning.

(15) *Co kwa (a)-ku-m.*
I PRFV SG-go-IRR
I shall go.

The present perfective aspect is indicated by *mara*. This aspect is used for events that occur very close to the moment of speaking. Thus it fittingly co-occurs with the present tense and the realis suffix. In narrative discourse, the present perfective is often used at the very peak of an episode.

(16) *Came-bo mara b-a-kot-ri-s.*
(Name)-obj.marker PRPF PRES-SG-cut-AUG-RL
Straight away he cut Came.

3.1.3 STATIVE ASPECT

The stative aspect marker, *-bïre*, refers to states rather than actions that are still ongoing.

(17) *Com tat bïre b-a-mon-am.*
my father STAT PRES-SG-sit-IRR
My father is still alive.

3.1.4 THE TWO HABITUAL ASPECTS

There are two types of HABITUAL aspect in Kwerba. Both types refer to an action that occurs over an extended period of time. While all the other aspects occur as aspect auxiliaries preceding the verb, the two habitual aspects occur as suffixes. Thus it is possible for the habitual aspects to co-occur with the aspectual auxiliaries. Comrie (1976:30ff.) states that "Habituality is in principle combinable with various other semantic aspectual values, namely those that are appropriate to the kind of situation that is prolonged or iterated". He describes habituality as possible in "any situation that can be protracted sufficiently in time or that can be iterated a sufficient number of times over a long enough period." Kwerba has two habituals: NONITERATIVE, indicating an action that takes place over a period of time and ITERATIVE, indicating repetitive action over a period of time. The table below illustrates how the two types of habituals interact with the status categories of realis and irrealis.

TABLE 1: KWERBA ITERATIVE ASPECT

		ASPECT	
		ITERATIVE	NONITERATIVE (protracted)
STATUS	REALIS	*-son/-sau*	*-on*
	IRREALIS	*-so-m*	*-on-am*

The iterative aspect indicates repetitive action over a period of time. When status is realis, the form is either *-son* or *-sau* (example (18)), while with irrealis, the form is *-so-m* (example (19)).

(18) *Co bo-ra b-a-nïtie-son-Ø.*
I that-TR PRES-SG-hear-ITR-RL
I kept on hearing. *or* I have continually (again and again) heard about it.

(19) *Co Aurim-be-ra b-a-mon-so-m.*
I Aurimi-at-TR PRES-SG-sit-ITR-IRR
I usually live at Aurimi.

The non-iterative aspect is used to describe an event that has been prolonged over a period of time.

(20) *Nino bituabo kwa ec-e-rat-on-Ø.*
we water PRFV RP-1PL-come-NITR-RL
We continued to come following the river.

(21) *Siraba wïre b-a-sakan-on-am.*
fire PROG PRES-SG-burn-NITR-IRR
The fire continues to burn on.

3.1.5 PROGRESSIVE ASPECTS

There are two PROGRESSIVE markers in Kwerba. One marker, *wïre*, has two somewhat different meanings: an ongoing activity of an action (PROGRESSIVE meaning), or the beginning of an action or series of actions (INCEPTIVE meaning). Both of these aspectual meanings are strongly imperfective and contrast sharply with the perfective aspect. Consider example (22):

(22) *Co wïre b-a-kot-ri-m*
I PROG PRES-SG-cut-AUG-IRR
I am cutting it. *or* I am beginning to cut it.

In narrative discourse, *wïre* is often used to indicate the beginning of a series of events. Thus it gives the setting and overview of the events that follow.

(23) *Nino Weim-be wïre ec-e-betïrï-c.*
we Weim-at PROG RP-1PL-follow-RL
We began following the Waim river.

After the narrator made the statement of (23) in his discourse, he elaborated on the various details and events of his trip on the Waim.

The other progressive category marker is *maya*, NONCOMPLETIVE PROGRESSIVE, used to indicate continuous ongoing action. It has the flavour of 'still verb-ing' in English where there is focus on the fact that the action has not yet been terminated.

(24) *Co maya b-a-korie-m.*
I NCPROG PRES-SG-write-IRR
I am still writing.

3.2 MOOD

The following mood forms may be identified in Kwerba verb morphology:

TABLE 2: MOOD

		AFFIRMATIVE	NEGATIVE
DECLARATIVE		*Ø*	*kwai*
			-o baye
INTERROGATIVE		*-ta*	
IMPERATIVE	STRONG (immediate)	*bakwa*	*kwe*
	WEAK (polite)	*akwa*	
	SUGGESTIVE	*wïra*	
	EXHORTATIVE	*wïrere*	

3.2.1 DECLARATIVE MOOD

As in most languages, DECLARATIVE Kwerba is the unmarked MOOD. Grammatically, it has no unique morpheme to distinguish it. There are a number of adverbs that occur only with the DECLARATIVE MOOD.

3.2.2 IMPERATIVE MOOD

The STRONG IMPERATIVE mood is marked by *bakwa*, and must co-occur with the realis status. For example:

(25) *Am bakwa (a)-kot-ri-s!*
you IMPS SG-cut-AUG-RL
You cut it!

The WEAK (POLITE) IMPERATIVE is *akwa*. This is a more polite form than *bakwa*, appropriate when addressing adults. It does not as strongly express immediate action as *bakwa*. This form is also used to indicate permission, such as in leave taking.

(26) *Am akwa (a)-ku-Ø.*
you IMPP SG-go-RL
You can go now.

The SUGGESTIVE IMPERATIVE (EXHORTATIVE) is *wïra*. It does not command action, but simply suggests or exhorts someone to undertake the action.

(27) *Am buku wïra mïcasiac.*
(a)-mïca-sia-c.
you book EXH SG-return-AUG-RL
You should return the book.

The usual form for the suggestive imperative, *wïra*, can also occur in the first person dual and plural. In this case it functions as an exhortative to motivate people to action. In the case of the first person plural, vowel harmony occurs with the personal marker *e*, causing the suggestive imperative *wïra* to be realised as *wïrere*:

wïra → *wïrere* / __ *e*

(28) *Nino wïrere ec-ibiri-c.*
we EXH 1PL-rise-RL
Let us stand up.

3.2.3 PROHIBITIVE MOOD

The PROHIBITIVE (negative imperative) mood is *kwe*. It co-occurs with the present tense and the irrealis status. Since that which is prohibited is intrinsically unrealised, the irrealis status is used.

(29) *Am kwe b-a-kot-ri-m!*
you PROH PRES-SG-cut-AUG-IRR
Don't you cut it!

3.2.4 NEGATIVE MOOD

The NEGATIVE mood, as the inverse of the unmarked declarative, negates a sentence. It always co-occurs with the irrealis status, indicating that the action has never been realised. Negatives cannot occur with other moods and the future negative mood occurs in the same preverbal slot as other moods. There are two negative forms; one is for the future and the other for the past.

The future negative mood is expressed by *kwai* preceding the verb:

(30) *Co kwai kotrim.*
Co kwai (a)-kot-ri-m
I NEGF SG-cut-AUG-IRR
I will not cut it.

The past negative mood is expressed by a final verbal suffix *-o* followed by the negator *baye*.

(31) *Co kotrimo baye.*
Co kot-ri-m-o baye
I cut-AUG-IRR-NG NEGP
I did not cut it.

3.2.5 INTERROGATIVE MOOD

The INTERROGATIVE may co-occur with aspectual prefixes. It is regularly indicated by the morpheme *-ta* which functions as a polarity device expecting a 'yes' or 'no' answer. The interrogative morpheme *-ta* attaches to the pre-verbal auxiliary as a postclitic. This is illustrated in sentences (32) and (33) below:

(32) *Am tato bïre-ta b-a-mon-am?*
your dad STAT-QM PRES-SG-sit-IRR
Is your father still living?

(33) *Am cara-ta beri-c?*
you PERF-QM married-RL
Are you already married?

Occasionally, this interrogative postclitic *-ta* functions as a component of a content question by attaching to the word that is being questioned, as in sentence (34) below:

(34) *Am awe-ta naia anan?*
Am awe-ta naia a-nan-Ø
you else-QM what RP-eat-RL
What else did you eat?

3.3 MODALS

There are several modals in Kwerba which reflect qualifiers of intention, ability, and so forth on the performance of an action. Some of the most common modals are described below.

The modal of INTENT, *abara*, is used to declare a person's intention to carry out an action in the future.

(35) *Co abara (a)-co-m.*
I INT SG-come-IRR
I will come.

There is also an EMPHATIC modal, *kwera*, which indicates that the speaker certainly plans to carry out the action.

(36) *Co kwera (a)-co-m.*
I CER SG-come-IRR
I certainly will come.

These two modals can be combined to produce a very emphatic statement. This is an exception to the general rule stated in §2 that two auxiliaries cannot co-occur.

(37) *Co abara kwera (a)-co-m.*
I INT CER SG-come-IRR
I most certainly will come.

The ABLATIVE modal *bo* indicates the ability to do something.

(38) *Co bo (a)-kot-ri-m.*
I ABL SG-cut-AUG-IRR
I can cut it.

The modal of UNFULFILLED INTENTION, *kaita*, indicates that although the speaker has not yet undertaken a specified action, he definitely intends to do so. This modal co-occurs with the realis status, which perhaps certifies the seriousness of the intention.

(39) *Co kaita b-a-kot-ri-s.*
I UNFIN PRES-SG-cut-AUG-RL
I have not yet cut it (but I intend to).

The PERMISSIVE modal, *kaia*, indicates the speaker is giving permission for someone to carry out an action.

(40) *Am kaia (a)-kot-ri-s.*
you PERM SG-cut-AUG-RL
You may cut it.

(41) *Iinïm*
he PERM SG-go-RL
He may go now.

4. VERBAL AFFIXES

Events involve participants in time and space. The Kwerba verb reflects these concepts in its affixation. Participant actors are reflected in subject marking prefixes (§4.2), while objects acted upon may be modified using certain suffixes (§4.3). The crucial dimension of time is represented by tense prefixes working in tandem with status suffixes (§4.1.2), while space is represented by various locational and directional suffixes (§4.4).

4.1 TEMPORAL DEIXIS: TENSE AND STATUS

In Kwerba, tense categories function together with status categories to express the total spectrum of temporal deixis. Tense is marked with verbal prefixes, while status is marked by verbal suffixes.

4.1.1 TENSE

In example (11) above, in which the verb is *wïre*
the tense morpheme is *b-*, which locates the action of cutting in temporal relation to the speaker's declaration. In the following discussion of the Kwerba tense morphemes, one must keep in mind that there is a close interrelationship of tense and status, which was discussed in §3.1.3. The tenses are listed below:

b Present Tense (speech act time). The event referred to in the verb occurs **at the same time** that the speaker is speaking. The present tense can co-occur with either the realis or irrealis status, depending on the aspectual auxiliary used.

ac Recent Past Tense. The event occurred some time **prior to the day of speaking but within the memory of the speaker**. For example, an old man might use the recent past morpheme when referring to an event that occurred when he was a young man. The recent past co-occurs with the realis status except with negatives which take an irrealis status.

Ø Immediate Past Tense. The event occurred **prior to the time of the speech act** and is marked for realis status.

Ø Distal Tense. Events that occurred **in the far past and events that might occur in the future** also have a *Ø* tense morpheme (unmarked). However, since the irrealis status must also be used, this tense is readily distinguishable from the immediate past tense. Since the events of the far past or of the future are so far removed from the current situation, they are in effect tenseless.

There are certain morphophonemic processes that occur when the recent past tense morpheme *ac-* co-occurs with the singular subject morpheme *a-*.

Portmanteau: $ac + a \rightarrow ac$

C-deletion: $c \rightarrow Ø / \_\_$ Consonant initial verb root

In the first rule above, the recent past tense morpheme *ac-* merges with the singular subject marker *a-* to become a portmanteau morpheme *ac-*. In the second rule, the *c* of the *ac-* portmanteau morpheme is deleted preceding a verb root which begins with a consonant.

Furthermore, when the recent past tense morpheme *ac-* co-occurs with the first person plural *e-*, vowel harmony results and the vowel morpheme *inac-* harmonises to the first plural *e*, producing *ec-*.

Vowel harmony: $ac + e \rightarrow ec + e$

4.1.2 STATUS

Status is usually signalled as a broad opposition of REALIS versus IRREALIS. As defined by Foley (1986:158) status "expresses the actuality of the event, whether it has been realised or not. The basic distinction here is a binary one, realis versus irrealis." This type of distinction is very prominent in Kwerba. All events that have actually occurred in recent time are marked in the verb as realis. Events that have not happened or that are going to happen in the future are marked in the verb as irrealis. It is interesting to note that in Kwerba events of the far past which occurred before the speaker's lifetime and events of the mythical past also take the irrealis suffix, a usage that has been noted in other languages of New Guinea (for example Yimas, Foley:1986). The opposition of realis versus irrealis may be seen in the following two examples:

(42)a. *Co abara (a)-kot-ri-m.*
I INT SG-cut-AUG-IRR
I will cut it.

b. *Co cara (a)-kot-ri-s.*
I PERF SG-cut-AUG-RL
I have cut it.

The unmarked form for the realis status is *-c*, but it is subject to the following morphophonemic rules.

In an environment following a high front vowel, the *-c* becomes *-s*.

Sibilantisation $c \rightarrow s / i\_\_$

Following a consonant, the *-c* becomes assimilated resulting in a *Ø* morpheme.

C-deletion $c \rightarrow Ø / C\_\_$

4.1.3 INTERACTION OF TENSE AND STATUS

There is a systematic interaction between status and tense in Kwerba as summarised by Table 3 and illustrated in examples (43a)-(43e).

TABLE 3: THE SYSTEM OF STATUS AND TENSE

irrealis *-m*	realis *-c (-s/-Ø)*		irrealis *-m*	
	recent past tense	immediate past tense	present tense	
Ø far past time	*ac-* recent past time	*Ø* earlier in the day time	*b-* present moment of speaking	*Ø* future time
Ø-ku-m went (in a story or myth)	*ac-ku-Ø* went	*Ø-ku-Ø* went (earlier today)	*ba-ku-m* am going	*Ø-ku-m* will go

Note that columns 2 and 3 usually represent events in time that have been actualised in the lifetime experience of the speaker. Note that columns 1 and 5 usually represent events in time that are 'distant' from the present experience of the speaker. The far past and future tenses are events that have not been actualised in the speaker's experience. Far past irrealis *-m*, unrealised present and unrealised future irrealis *-m* are the same as defined in the paper. This might be confusing to a new expatriate speaker of Kwerba, but the whole analysis is based on this distinction.

(43)a. Far past tense (FP) co-occurs with irrealis status:
Iinembwano bona (Ø)-ang-ku-m taman-abate.
them.two TADV FP-DU-go-irrealis house-to
At that time long ago they (two) went to the house.

b. Recent past tense (RP) co-occurs with realis status:
Iinembwano bona ac-ang-ku-(Ø) taman-abate.
them.two TADV RP-DU-go-realis house-to
At that time they (two) went to the house.

c. Immediate past tense (IMM) co-occurs with realis status:
Iinembwano cara (Ø)-ang-ku-(Ø) taman-abate.
them.two PERF IMM-DU-go-realis house-to
They (two) have already gone to the house.

d. Present tense (PRES) co-occurs with irrealis status:
Iinembwano wire b-ang-ku-m taman-abate.
them.two PROG PRES-DU-go-irrealis house-to
They (two) are going to the house.

e. Future tense (FUT) co-occurs with irrealis status:
Iinembwano abara (Ø)-ang-ku-m taman-abate.
them.two INT FUT-DU-go-irrealis house-to
They (two) will go to the house.

4.2 SUBJECT PERSON-NUMBER MARKING

Referents of the major grammatical relations, subject and object, receive a registration in the verb in Kwerba. The person and number of the subject is indicated by an obligatory (henceforth the 'subject prefix'), and that of the object by a suffix (henceforth the 'object suffix', as reflected in Figure 3 above.

It will be useful, before discussing the subject prefixes, to give the set of free pronouns in the nominative case. They are as follows:

TABLE 4: FREE PRONOUNS OF NOMINATIVE CASE

		SINGULAR	DUAL	PLURAL
1st person	exclusive	*co*	*nano'*	*nino*
	inclusive		*na'no*	*neno*
2nd person		*am*	*nono*	*nom*
3rd person		*iniim*	*inembwano*	*inembwa*

4.2.1 SUBJECT PREFIX CLASSES

Kwerba subject prefixation defines five classes of verbs. For ease of reference, we will number and label these classes in terms of subject prefix form as follows:

I. THIRD PLURAL NASAL CLASS

II. DUAL-PLURAL NASAL FINAL CLASS

III. ALL PLURAL NON-NASAL

IV. INTRANSITIVE MOTION PLURAL *-r-* CLASS

Class I is composed mostly of transitive verbs, while classes II and III are composed of mostly intransitive verbs, and class IV is specifically intransitive verbs. Classes I and II are predominant, accounting for about 85% of the data.

The basic forms for the subject prefixes are given in the paradigm tables that follow. There are also alternate forms for many of these prefixes, which result from morpho-

phonemic processes. The morphophonemic rules are spelled out in §3.2.2. In the examples following each chart, letters in parentheses correspond to phones of the basic forms which are lost through the application of morphophonemic rules.

Subject prefixes which occur with verbs of class I may be summarised as follows:

TABLE 5: CLASS I VERBS: THIRD PLURAL NASAL

	SINGULAR	DUAL	PLURAL
1st person	*a*	*ac*	*ec*
2nd person	*a*	*ac*	*ac*
3rd person	*a*	*ac*	*naN*

(N = morphophonemic assimilation of the nasal to the point of articulation of the following consonant.)

This set of verbs is unique in that it has a final consonant *c-* in both the dual and plural subject markers. This final *c-* is deleted preceding a consonant-initial verb root. When this happens, the subject prefix forms are identical for singular and dual forms. However, the third plural form never loses the final nasal. Hence, the essential distinguishing feature for this verb class is the final nasal of the third person plural.

Examples of class I verbs are given below:

		SG	DU	PL
(44)	*orec/oret* to carry			
	1st	*wïre b-(a)-orec-am*	*wïre b-ac-oret-am*	*wïre b-ec-oret-am*
	2nd	*wïre b-(a)-orec-am*	*wïre b-ac-oret-am*	*wïre b-ac-oret-am*
	3rd	*wïre b-(a)-orec-am*	*wïre b-ac-oret-am*	*wïre b-(n)an-oret-am*

		SG	DU	PL
(45)	*kot* to cut			
	1st	*wïre b-a-kot-ri-m*	*wïre b-a(c)-kot-ri-m*	*wïre b-e(c)-kot-ri-m*
	2nd	*wïre b-a-kot-ri-m*	*wïre b-a(c)-kot-ri-m*	*wïre b-a(c)-kot-ri-m*
	3rd	*wïre b-a-kot-ri-m*	*wïre b-a(c)-kot-ri-m*	*wïre b-(n)ang-kot-ri-m*

		SG	DU	PL
(46)	*ben* to drink			
	1st	*wïre b-a-ben-am*	*wïre b-a(c)-ben-am*	*wïre b-e(c)-ben-am*
	2nd	*wïre b-a-ben-am*	*wïre b-a(c)-ben-am*	*wïre b-a(c)-ben-am*
	3rd	*wïre b-a-ben-am*	*wïre b-a(c)-ben-am*	*wïre b-(n)am-ben-am*

		SG	DU	PL
(47)	*ikwaric* to put into (with negative *kwai*, did not put into)			
	1st	*kwai-(a)-ikwaric-am*	*kwai-ac-ikwaric-am*	*kwai-ec-ikwaric-am*
	2nd	*kwai-(a)-ikwaric-am*	*kwai-ac-ikwaric-am*	*kwai-ac-ikwaric-am*
	3rd	*kwai-(a)-ikwaric-am*	*kwai-ac-ikwaric-am*	*kwai-nan-ikwaric-am*

	SG	DU	PL
(48)	*tumw* to plant		
1st	*wire b-a-tumw-an-eem*	*wire b-a(c)-tumw-an-eem*	*wire b-e(c)-tumw-an-eem*
2nd	*wire b-a-tumw-an-eem*	*wire b-a(c)-tumw-an-eem*	*wire b-a(c)-tumw-an-eem*
3rd	*wire b-a-tumw-an-eem*	*wire b-a(c)-tumw-an-eem*	*wire b-(n)an-tumw-an-eem*

Classes II, III, and IV are basically intransitive verbs. However, there are some verbs that seem to be transitive which follow the pattern of classes II and III. The description that follows will be limited to intransitive verbs.

The size of the subject is reflected in the singular subject marker prefixes of all intransitive verbs. We refer to this as MAGNITUDE. Lesser magnitude (small objects) is termed DIMINUTIVE while greater magnitude (large objects) is termed AUGMENTATIVE.

Table 6 displays the basic forms of Class II subject prefixes. This class comprises the major intransitive verb class as most intransitive verbs take this set of prefixes.

TABLE 6: CLASS II INTRANSITIVE VERBS: DUAL/PLURAL NASAL FINAL

	SINGULAR DIMINUTIVE	SINGULAR AUGMENTATIVE	DUAL	PLURAL
1st	*naN*	*a*	*aN*	*eN*
2nd	*naN*	*a*	*aN*	*aN*
3rd	*naN*	*a*	*aN*	*naN*

Notice that the first person plural form uniquely manifests a front vowel, just as the corresponding free form plural pronouns, *neno* and *nino*. Also, the second person plural, as with class I earlier, has the same form as the duals (except in a few verbs with irregular characteristics). Magnitude of the subject referent is reflected in affix choice for the singular subject. Just as dual is of a lesser magnitude than plural, so 'small' is of lesser magnitude than 'large'. It is interesting to note the similarity in the form for singular diminutive, *naN*, and dual *aN*. Both of these lesser forms are often identical in the surface structure due to changes imposed by the morphophonemic rules. (The morphophonemic variants will be treated in §4.2.2.) The diminutive form is typically used when a very small child is the subject of the clause. It can also be used when the subject is a very small animal, for example butterfly, or for a thing that is light and of the size that could be easily held in the hand, for example, a stick. There are however, a few exceptions to this rule. For example, a canoe and an aeroplane are referred to with the diminutive form.

The distinguishing feature of this class of verbs is that the subject prefixes of both the dual and plural forms end in a nasal. In fact, only the singular augmentative forms lack a final nasal.

The following verb paradigms illustrate the Class II subject prefix pattern:

	SG-small	SG-large	DU	PL
(49)	*sakan* to burn			
1st	*wïre b-(n)an-sakan-am*	*wïre b-a-sakan-am*	*wïre b-an-sakan-am*	*wïre b-en-sakan-am*
2nd	*wïre b-(n)an-sakan-am*	*wïre b-a-sakan-am*	*wïre b-an-sakan-am*	*wïre b-an-sakan-am*
3rd	*wïre b-(n)an-sakan-am*	*wïre b-a-sakan-am*	*wïre b-an-sakan-am*	*wïre b-(n)an-sakan-am*

	SG-small	SG-large	DU	PL
(50)	*kasian* to cough			
1st	*wïre b-(n)ang-kasian-am*	*wïre b-a-kasian-am*	*wïre b-ang-kasian-am*	*wïre b-eng-kasian-am*
2nd	*wïre b-(n)ang-kasian-am*	*wïre b-a-kasian-am*	*wïre b-ang-kasian-am*	*wïre b-ang-kasian-am*
3rd	*wïre b-(n)ang-kasian-am*	*wïre b-a-kasian-am*	*wïre b-ang-kasian-am*	*wïre b-(n)ang-kasian-am*

	SG-small	SG-large	DU	PL
(51)	*boro* to roll			
1st	*wïre b-(n)am-boro-n-am*	*wïre b-a-boro-n-am*	*wïre b-am-boro-n-am*	*wïre b-em-bor-ar-am*
2nd	*wïre b-(n)am-boro-n-am*	*wïre b-a-boro-n-am*	*wïre b-am-boro-n-am*	*wïre b-am-bor-ar-am*
3rd	*wïre b-(n)am-boro-n-am*	*wïre b-a-boro-n-am*	*wïre b-am-boro-n-am*	*wïre b-(n)am-bor-ar-am*

	SG-small	SG-large	DU	PL
(52)	*isa-kat* to slip (plus negative kwai did not slip)			
1st	*kwai nan-isa-kat-ïm*	*kwai (a)-isa-kat-ïm*	*kwai an-isa-kat-ïm*	*kwai en-isa-kat-ïm*
2nd	*kwai nan-isa-kat-ïm*	*kwai (a)-isa-kat-ïm*	*kwai an-isa-kat-ïm*	*kwai an-isa-kat-ïm*
3rd	*kwai nan-isa-kat-ïm*	*kwai (a)-isa-kat-ïm*	*kwai an-isa-kat-ïm*	*kwai nan-isa-kat-ïm*

Subject affixes for class III verbs are summarised in the following chart:

TABLE 7: CLASS III INTRANSITIVE VERBS: ALL PLURAL NON-NASAL

	SINGULAR DIMINUTIVE	SINGULAR AUGMENTATIVE	DUAL	PLURAL
1st	*naN*	*a*	*aN*	*e*
2nd	*naN*	*a*	*aN*	*a*
3rd	*naN*	*a*	*aN*	*a*

In this minor class of verbs, there is a final nasal in the singular diminutive and dual forms. If the singular diminutive is paired with the singular augmentative, and the dual with the plural as a lesser-to-greater relationship in magnitude, then the generalisation is that the lesser member of each pair has a final nasal, while the greater member lacks it. Class III subject prefixes have no nasals in any of the plurals, which distinguishes it from classes I and II. Hence, the name for the class is "All Plural Non-nasal".

The verbs below exemplify the class:

	SG-small	SG-large
(53)	*mïca* to return	
1st	*wïre b-(n)a(N)-mïc-nye-bom*	*wïre b-a-mïca-nye-bo-m*
2nd	*wïre b-(n)a(N)-mïc-nye-bom*	*wïre b-a-mïca-nye-bo-m*
3rd	*wïre b-(n)a(N)-mïc-nye-bom*	*wïre b-a-mïca-nye-bo-m*

	DU	PL
1st	*wïre b-ana-mïca-nye-bo-m*	*wïre b-e-mïca-ri-bo-m*
2nd	*wïre b-ana-mïca-nye-bo-m*	*wïre b-a-mïca-ri-bo-m*
3rd	*wïre b-ana-mïca-nye-bo-m*	*wïre b-a-mïca-ri-bo-m*

+ see morphophonemic rule No.II.

(54) *aria/sar* to enter

	SG-small	SG-large	DU	PL
1st	*wïre b-(n)an-aria-n-am*	*wïre b-(a)-aria-n-am*	*wïre b-an-aria-n-am*	*wïre b-e-sar-ar-am*
2nd	*wïre b-(n)an-aria-n-am*	*wïre b-(a)-aria-n-am*	*wïre b-an-aria-n-am*	*wïre b-a-sar-ar-am*
3rd	*wïre b-(n)an-aria-n-am*	*wïre b-(a)-aria-n-am*	*wïre b-an-aria-n-am*	*wïre b-a-sar-ar-am*

(55) *kwa* to cry

	SG-small	SG-large	DU	PL
1st	*wïre b-(n)ang-kwa-n-am*	*wïre b-a-kwa-n-am*	*wïre b-ang-kwa-n-am*	*wïre b-e-kwa-s-am*
2nd	*wïre b-(n)ang-kwa-n-am*	*wïre b-a-kwa-n-am*	*wïre b-ang-kwa-n-am*	*wïre b-a-kwa-s-am*
3rd	*wïre b-(n)ang-kwa-n-am*	*wïre b-a-kwa-n-am*	*wïre b-ang-kwa-n-am*	*wïre b-a-kwa-s-am*

Verbs of Class IV take as subject prefixes the following forms:

TABLE 8: CLASS IV VERBS (INTRANSITIVE MOTION): PLURAL *-r-* CLASS

	SINGULAR	SINGULAR	DUAL	PLURAL
1st	*naN*	*a*	*aN*	*era*
2nd	*naN*	*a*	*aN*	*ara*
3rd	*naN*	*a*	*aN*	*ara*

This class of verbs is composed entirely of intransitive motion verbs. Its distinguishing characteristic is that it manifests a morpheme *-r-* in the plural. Below are some sample paradigms:

(56) *ku* to go

	SG-small	SG-large	DU	PL
1st	*wïre b-(n)ang-ku-m*	*wïre b-a-ku-m*	*wïre b-ang-ku-m*	*wïre b-era-ku-m*
2nd	*wïre b-(n)ang-ku-m*	*wïre b-a-ku-m*	*wïre b-ang-ku-m*	*wïre b-ara-ku-m*
3rd	*wïre b-(n)ang-ku-m*	*wïre b-a-ku-m*	*wïre b-ang-ku-m*	*wïre b-ara-ku-m*

(57) *cu~t* to come

	SG-small	SG-large	DU	PL
1st	*wïre b-(n)an-cu-m*	*wïre b-a-cu-m*	*wïre b-an-cu-m*	*wïre b-era-t-am*
2nd	*wïre b-(n)an-cu-m*	*wïre b-a-cu-m*	*wïre b-an-cu-m*	*wïre b-ara-t-am*
3rd	*wïre b-(n)an-cu-m*	*wïre b-a-cu-m*	*wïre b-an-cu-m*	*wïre b-ara-t-am*

(58) *itamo/muyo* to fall

	SG-small	SG-large	DU	PL
1st	*wïre b-(n)an-itamo-n-am*	*wïre b-(a)-itamo-n-am*	*wïre b-an-itamo-n-am*	*wïre b-er-era-muyo-m*
2nd	*wïre b-(n)an-itamo-n-am*	*wïre b-(a)-itamo-n-am*	*wïre b-an-itamo-n-am*	*wïre b-ar-ara-muyo-m*
3rd	*wïre b-(n)an-itamo-n-am*	*wïre b-(a)-itamo-n-am*	*wïre b-an-itamo-n-am*	*wïre b-ar-ara-muyo-m*

4.2.2 SUBJECT PREFIX MORPHOPHONEMICS

The basic forms of the subject prefixes, to which the morphophonemic rules below apply, have the following syllable shapes:

V: *a, e*
VC: *ac, ec, aN, eN*
nVN: *naN*

The processes which generate the variant surface allomorphs from these forms are:

Rule 1: nasal assimilation
(a) to consonants
(b) to vowels

Rule 2: *a*-epenthesis

Rule 3: *a*-deletion

Rule 4: *C*-deletion

Rule 5: *N*-deletion

Rule 1: Nasal assimilation

(a) Assimilation to consonants

The final nasal consonant of the subject marker assimilates to the initial segment of the following verb root.

VN	→ V	*m* *n* *ng*	/	___	labial front lingual back lingual	(initial consonant of verb root)

The following examples illustrate this rule:

(59) *Nano wire b-ang-ku-m.*
we.2 PROG PRES-DU-go-IRR
We two are going. (Class IV, dual)[7]

(60) *Nano okwabo wire b-am-boro-n-am.*
we.2 rock PROG PRES-DU-roll-AUG-IRR
We two are rolling the rock. (Class II, dual, 2nd/3rd plural)

(61) *Iinembwa kasanabo wire b-an-tumw-an-am.*
they bananas PROG PRES-3PL-plant-AUG-IRR
They are planting bananas. (Class I, 3rd plural)

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7 Class type notations allow the reader to correlate the examples to the tables to see how the example fits into the larger context of verb classes.

(b) Assimilation to vowels

VN → Vn / ___ V (vowel initial verb root)

The following example illustrates this rule, in which *an* and *en* appear preceding the vowel initial root *omwo* 'to call':

	SG	DU	PL
(62)	*omwo* to call (Class II)		
	1st *wïre b-(a)-omwo-n-am*	*wïre b-an-omwo-n-am*	*wïre b-en-omw-ar-am*
	2nd *wïre b-(a)-omwo-n-am*	*wïre b-an-omwo-n-am*	*wïre b-an-omw-ar-am*
	3rd *wïre b-(a)-omwo-n-am*	*wïre b-an-omwo-n-am*	*wïre b-(n)an-omw-ar-am*

Rule 2: *a*-epenthesis

When a subject prefix ends with a nasal, and the verb begins with an initial nasal, an epenthetic *-a-* occurs between the two nasals, that is:

VN → V*na* / ___ Nasal-initial root

The epenthesis process is illustrated in the class I prefixes below, as an *a* has been inserted between the final nasal of the prefix and the initial nasal of the root.

(63) *me* to step on (Class III)

	SG	DU	PL
1st	*wïre b-a-me-an-am*	*wïre b-ana-me-an-am*	*wïre b-ena-me-an-am*
2nd	*wïre b-a-me-an-am*	*wïre b-ana-me-an-am*	*wïre b-ana-me-an-am*
3rd	*wïre b-a-me-an-am*	*wïre b-ana-me-an-am*	*wïre b-(n)ana-me-an-am*

	SG	DU	PL
(64)	*mireret* to submerge (Class III)		
1st	*wïre b-a-mireret-am*	*wïre b-ana-mireret-am*	*wïre b-ena-mireret-am*
2nd	*wïre b-a-mireret-am*	*wïre b-ana-mireret-am*	*wïre b-ana-mireret-am*
3rd	*wïre b-a-mireret-am*	*wïre b-ana-mireret-am*	*wïre b-(n)ana-mireret-am*

Rule 3: *a*-deletion

The singular subject prefix *a-* is deleted if it is contiguous to another vowel, as in the following examples. Parentheses *(a)* mark the deleted element:

(65) *Co kwai (a)-ben-am.*
I NEGF SG-drink-IRR
I won't drink it.

(66) *Co kwai (a)-o-re-c-am.*
I NEGF SG-bring-AUG-FAR-IRR
I won't bring it to there.

(67) *Co wïre b-(a)-iriai-am.*
I PROG PRES-SG-slice-IRR
I am slicing it.

Rule 4: *C*-deletion

Certain consonants may not occur contiguously across certain morpheme boundaries. The boundary between subject prefix and verb root is such a case. The final consonant (C) of the subject prefix is deleted if it would co-occur with an initial consonant of a following verb root (cf. Rule 3 above for vowel deletion counterpart):

C → Ø / ___ C (Consonant initial verb root)

As an example, observe the loss of the palatal consonant *c* in the following class I examples (deleted consonant in parentheses):

(68) *wïre* *b-a(c)-kot-ri-m*
PROG PRES-DU-cut-AUG-IRR
to cut (dual/2nd plural)

(69) *wïre* *b-e(c)-kot-ri-m*
PROG PRES-1PL-cut-AUG-IRR
to cut (1st plural)

(70) *wïre* *b-a(c)-moka-ri-m*
PROG PRES-DU-wash-AUG-IRR
to wash (dual/2nd plural)

Rule 5: *N*-deletion

The initial nasal consonant *n*- of the underlying third person plural subject prefix *naN* and the singular diminutive *naN* are deleted when they immediately follow a consonant.

naN → *aN* / C ___

Compare, for example, the deletion of *n* in (71), as opposed to the retention of *n* in (72):

(71) *Wïre* *b-(n)ang-kot-ri-m.*
PROG PRES-3PL-cut-AUG-IRR
They are cutting.

(72) *Kwai* *nang-kot-ri-m.*
NEGF 3PL-cut-AUG-IRR
They will not cut it.

4.3 OBJECT MARKING

As previously illustrated (Figure 2), the slot immediately following the verb stem is for the direct object marker in the case of transitive verbs. Referring again to Figure 3 *wïre b-a-kot-arari-an-am* 'I am cutting (a piece of) wood over there', the suffix *-arari* marks the object. The object is marked not only for NUMBER, but also for SIZE. To accommodate both of these features, we may say that objects are marked for MAGNITUDE. To illustrate, consider the following examples:

(73) *kot* to cut

Co wire b-a-kot-oari-m.	I cut one small object.
Co wire b-a-kot-ri-m.	I cut one large object.
Co wire b-a-kot-oari-m.	I cut two objects.
Co wire b-a-kot-arari-m.	I cut many objects many times.
Co wire b-a-kot-ïsi-am.	I cut many objects many times.

(74) *bïs* to carry

Co wïre b-a-bïs-in-t-am.	I carry one small object.
Co wïre b-a-bïs-an-t-am.	I carry one large object.
Co wïre b-a-bïs-in-t-am.	I carry two objects.
Co wïre b-a-bïs-an-t-am.	I carry many objects.

In the examples above, small single objects and dual objects are marked the same. In (73) *-oari* marks the singular small or dual, while single large and plural are marked with *-ri*. Thus, the 'lesser' degree of magnitude is opposed to the 'greater' degree in both size and quantity. The same distinctions are made in example (74), with the verb *bïs* 'to carry', where the morphemes marking the distinctions are not *-oari* versus *-ri*, but *-in* versus *-an*. These relationships may be illustrated as in Table 9:

TABLE 9: LESSER MAGNITUDE VERSUS GREATER MAGNITUDE

		SIZE		NUMBER
LESSER MAGNITUDE	*oari*	one small object	*oari*	two objects
	in	one small object	*in*	two objects
GREATER MAGNITUDE	*ri*	one large object	*arari*	many objects
	an	one large object	*an*	many objects

Thus, object marking in Kwerba does not specify person or gender, but rather magnitude. Magnitude includes the notion of number and size of the object. Magnitude is also extended to a characterisation of action in terms of its multiplicity or repetitiveness. There can be a shifting of the suffixes used depending on whether the focus is on the number of objects or the repetitiveness of the action. Some verbs have practical semantic constraints on the way in which magnitude is expressed. For example, *wire batoam*, the verb 'to pour', does not indicate the amount of the object under normal circumstances since that would be very hard to measure. On the other hand, this verb keeps track of how many times the action took place.

The following paradigm charts display generally the fashion in which the magnitude features (size, number, and repeated action) interact for three verbs, *kot* 'to cut', *sï* 'to touch', and *sok* 'to break'. The charts reveal a great number of forms for object marking. The Appendix summarises the object marking of several dozen verbs, but focuses only on the features of number of objects, and size in the case of a single object. Even simplified to this extent the system is exceedingly complex. There are possibly classes of verbs which take the same object markers. Further study of the object markers needs to be undertaken.

Object marking[8]

(75) *kot* to cut

SG-small	SG-large	DU-small	DU-large	PL-small	PL-large
SG action					
kot-oari-m	*kot-ri-m*	*kot-oari-m*	*kot-oare-c-am*	*kot-arari-am*	*kot-arari-m*
DU action					
kot-oi	*kot-oare-c-am*	*kot-oari-m*	*kot-oare-c-am*	*kot-in-am*	*kot-arari-m*
PL action					
kot-in-am	*kot-i-m*	*kot-in-am*	*kot-iriri-m*	*kot-iriri-m*	*kot-arari-m*
Extensive PL action					
kot-isi-am			*kot-arari-m*		*kot-ara-si-am*
PL action on great quantity of objects					*kot-ti-si-am*
PL action many times on great quantity of objects					*kot-arar-si-am*

(76) *sï* to touch

SG-small	SG-large	DU-small	DU-large	PL-small	PL-large
SG action					
sï-kek-oari-m	*sï-so-ri-m*	*sï-kek-oari-m*	*sï-sok-oari-m*	*sï-ke-tuk-oari-m*	*sï-so-tuk-oari-m*
DU action					
sï-ke-sï-m	*sï-so-rai-am*	*sï-ke-tu-m*	*sï-so-tu-m*	*sï-ke-tuk-oari-m*	*sï-so-tuk-oari-m*
PL action					
sï-ke-tu-m	*sï-so-rai-am*	*sï-ke-tu-m*	*sï-so-tu-m*	*sï-ke-tuk-oari-m*	*sï-so-tuk-oari-m*

NOTE: In this verb, *sï*, the marker *-ke* always indicates small object, while *-so* always indicates a large object. However, magnitude is still also indicated in the following suffix.

(77) *sok* to break

SG-small	SG-large	DU-small	DU-large	PL-small	PL-large
SG action					
sok-oari-m	*sok-ri-m*	*sok-in-am*	*sok-ari-m*	*sok-arari-m*	*sok-ari-m*
DU action					
sok-in-am	*sok-in-am*	*sok-oari-m*	*sok-in-am*	*sok-oari-m*	*sok-ari-m*
PL action					
sok-in-am	*sok-i-m*	*sok-in-am*	*sok-oari-m*	*sok-ari-m*	*sok-ereri-m*

4.4 SPATIAL DEIXIS: LOCATIONALS AND DIRECTIONALS

SPATIAL DEIXIS is indicated by a locational or directional suffix. There are three degrees of distance that may be registered. When there is no overt locational marker, the action is PROXIMAL, taking place near the speaker. DISTAL action is marked by the suffix *-an*, which

8 Due to the complexity and amount of examples in this section, verbal auxiliaries and prefixes are not shown. The examples all begin with the verb stem and include all normal suffixation.

indicates that the action took place at a nearby location. There is also a FAR DISTAL suffix *-et*, indicating an action that has occurred a considerable distance away from the speaker. Consider the following examples:

(78)a. *Co cara (a)-kot-ri-Ø-s.*
I PERF SG-cut-AUG-PROX-RL
I have already cut it here.

b. *Co cara (a)-kot-ri-an-Ø.*
I PERF SG-cut-AUG-DIS-RL
I have already cut it over there.

c. *Co cara (a)-kot-ri-et-Ø.*
I PERF SG-cut-AUG-FAR-RL
I have already cut it at a far away place.

(79)a. *Co icabo cara (a)-bïsana-Ø-c.*
I wood PERF SG-carry-PROX-RL
I have carried the wood to here.

b. *Co icabo cara (a)-bïsana-an-Ø.*
I wood PERF SG-carry-DIS-RL
I have carried the wood from there (point a) to over there (point b).

c. *Co icabo cara bïsant.*
Co icabo cara (a)-bïsana-et-Ø.
I wood PERF SG-carry-FAR-RL
I have carried the wood from far over there (point a) to over there (point b).

Thus, the action, or the goal towards which the action is directed, is located with reference to the speaker in the physical world.

There are some transitive verbs which make further distinctions based on the location in relation to the speaker. In the following example (80) the morpheme *-can* indicates action that has occurred at a place to the side and at the same level as the speaker.

(80) *Co icabo cara abïsanacan.*
Co icabo cara (ac)-a-bïsana-can-Ø.
I wood PERF RP-SG-carry-SID-RL
I have carried the wood over there on the side.

In example (81), the morpheme *-bon* indicates that the action has taken place 'over there' at a different horizontal elevation (higher or lower) than that of the speaker.

(81) *Co icabo cara abïsambon.*
Co icabo cara ac-a-bïsana-bon-Ø.
I wood PERF RP-SG-carry-DLEV-RL
I have carried the wood at an elevation that is different from where I am now standing.

In some verbs of motion there are affixes which indicate direction in relation to the speaker. Note the following examples with the verb root *mïca*, 'to return':

(82)a. *Co wïre b-a-mïca-nye-bo-m.*
I PROG PRES-SG-return-?-here-IRR
I return to here.

b. *Co wïre b-a-mïca-nya-Ø-m.*
I PROG PRES-SG-return-?-there-IRR
I return to there.

c. *Co wïre b-a-mïca-ri-bo-m.*
I PROG PRES-SG-return-AUG-here-IRR
I return it to here.

d. *Co wïre b-a-mïca-si-Ø-am.*
I PROG PRES-SG-return-OBJ-there-IRR
I return it to there.

5. VERB STEMS

5.1 CHANGES IN VERB STEMS

Though most of this paper has been devoted to verbal auxiliaries and affixes, perhaps a few comments regarding the verb stem or predicates in general should be added.

Many verb stems in Kwerba, such as *kot* 'cut', are constant in form. However, not all verb stems remain constant. Some intransitive verb stems change in relation to the number of the subjects. Transitive verb stems sometimes change in relation to the number of the objects. Consider the following examples of stem variation depending on the number of objects:

(83)a. *Co cibicabo abarias wïre batacanam.*
b-a-tacan-am
PRES-SG-shoot.1-IRR
I pig one PROG shoot
I shoot one pig.

b. *Co cibicabo nenumwano wïre bunïm.*
b-(a)-u-nï-m
PRES-SG-shoot.2-DIM-IRR
I pigs two PROG shoot
I shoot two pigs.

c. *Co cibicabo ïsini wïre borienam.*
b-(a)-orien-am
PRES-SG-shoot.3-IRR
I pigs three PROG shoot
I shoot three pigs.

5.2 COMPOUND VERBS

Compound verb stems are formed when two verb stems combine together or an elevational combines with a verb stem to form a new nucleus. These new verb stems then function as a unit which can take the full range of affixation that other verb stems take.

Combinations that can occur together to form a new verb stem are limited. Compound verb stems are based on some common verb stems such as *mon* 'sit', *ku* 'go', *war* 'see'. The verb stems are linked together by the morphemes *ang* or *na*. Sometimes these compounds have a special meaning, such as compounds derived from *ku* 'go', which indicate iterative action. Some examples of compound verbs stems follow:

(84) *war-a(ng)-muyau-Ø*
see-CL-sit-RL
look around

(85) *war-ang-ku-m*
see-CL-go-IRR
looked around

(86) *wari-ang-ku-m*
cook-CL-go-IRR
cook repetitively

(87) *kot-i-ena-ku-m*
cut-AUG-CL-go-IRR
cut repetitively

5.3 ELEVATIONAL COMPOUNDS

There are three ELEVATIONAL prefixes that occur with some intransitive verbs of motion to form a verb stem. These prefixes distinguish whether the action is moving on a vertical or inclined (ascending or descending) plane. They are shown schematically in Figure 6. Note that the absence of an elevational prefix (*Ø*) means horizontal motion.

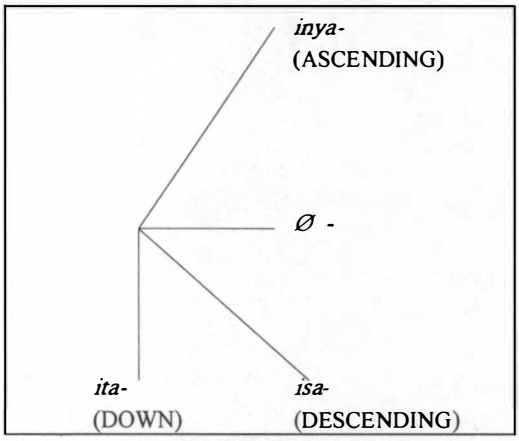

FIGURE 6: ELEVATIONAL PREFIXES

The prefix *inya-* marks a vertical ascending motion, as in:

(88) *Esaba tamanabo wïre binyakum.*
wïre b-(a)-inya-ku-m
woman house PROG PRES-SG-up-went-IRR
The woman enters the house (by ladder).

The prefix *isa-* immediately preceding the verb stem indicates a descending motion, as in these examples:

(89) *Anaba cara (a)-isa-ku-Ø.*
person PERF SG-down-go-RL
The person has gone down.

(90) *Ninamoraba cara (a)-isa-kati-c.*
child PERF SG-down-slip-RL
The child has slipped (down).

The prefix *ita-* indicates an unintentional downward motion.

(91) *Ninamoraba cara (a)-ita-mon-Ø.*
child PERF SG-down-sit-RL
The child fell down.

5.4 EQUATIVE PREDICATES

Furthermore, there are at least two types of equative predicates which do not take any of the affixations mentioned so far. One of these types is based on the stem *na*. There are three variants of *na*, which seem to contrast in their degree of definiteness. Consider the following examples:

Very Definite:

(92)a. *Maba meco bï-na.*
this table VDF-is
This one is that table.

b. *Maba nïnamor bï- na.*
this child VDF-is
This one is that child.

Definite:

(93)a. *Maba meco mï-na.*
this table DF-is
This is the table.

b. *Maba nïnamor mï-na.*
this child DF-is
This is the child.

Indefinite:

(94)a. *Maba meco o-na.*
this table IND-is
This is a table.

b. *Maba nïnamoro o-na.*
this child IND-is
This is a child.

In example (92), *bïna* is the equative verb used with the previously referred to subjects. In example (93), *mïna* is used for definite subjects. In example (94), *ona* refers to indefinite subjects. It is also interesting to note that the morphemes *bï* and *mï* occur elsewhere with a similar contrast of 'that' and 'the' (definite).

The second type of predication which takes minimal affixation is one that typically relates to physical or emotional states. Consider the following examples:

(95) *Co sari-an.*
I sick-am
I am sick.

(96) *Co ebïs-an.*
I hungry-am
I am hungry.

6. SUBORDINATION

Kwerba has a set of final order suffixes that indicate subordination and are used in dependent clauses. The suffix *-en* is a general subordinator.

(97) *Co bar bïre mïn abacerisen, nino bota bïri eceric.*
a-bac-eri-s-en *ec-e-ric*
I there STAT having RP-read-OJ-RL-GSUB we that inside RP-IPL-sleep
When I had read it (the letter), we slept inside there.

The suffix *-awon*, is used specifically for time subordination. This suffix is often used in the introductory paragraph of the narrative to give the setting.

(98) *Co cibicabo warian-awon, co abara ora-bo-m.*
I pig cook-TSUB I will bring.here-IRR
When the pig is cooked, I will bring it here.

7. BACKGROUNDING

Kwerba has a pair of final order verbal suffixes which indicate that the activity described in the clause is intended as background information. The information in the clause is not a main event that moves the story forward. The background markers function as discourse subordinators. These markers most frequently occur on speech act verbs and statives.

For example the suffix *-arïn* indicates background information in texts set in far past time. It always follows the irrealis status marker.

(99) *Muri mïr a-m-arïn, "Baye."*
Muri this say-IRR-FPBK no
Muri said, "No."

The suffix *-(a)beis* is the corresponding form indicating background information in stories that occurred in recent time. It always follows the realis status marker.

(100) *Anaba bir a-mon-Ø-beis.*
People in RP-live-RL-RBK
People were living there.

8. NOMINALISED VERBS

Nominals in Kwerba have post-clitic case markers that indicate whether the nominal functions as a subject, direct object, indirect object or instrument in the sentence. Singular, dual and plural as well as deictics are also indicated in these case endings. Note the post-clitic markers on the nominals in the following sentence.

(101) *Abac-ab-a-no kacatïn-am-acum cara ac-ac-orie-c.*
men-DDF-S-DU bird-DVD-PLOBJ PERF-RP-2S-shoot.PL-RL
Those two men shot these birds.

Verbs in Kwerba can take the same affixes as nominals. In Kwerba, the nominal case markers are attached to the verb after the irrealis suffix. The verb then becomes nominalised and functions as a nominal. Although the nominalised verb retains its obligatory suffixes, the prefixes become optional. In the following examples, the nominalised verb is the head of a relative clause structure.

(102) *Kotrim-aba cara es.*
kot-ri-m-ab-a cara (a)-es-Ø
cut-AUG-IRR-DDF-S PERF SG-flee-RL
The one who cut (her) has fled.

(103) *Kotrim-abo bakwa orabau.*
kot-ri-m-ab-o bakwa (a)-ora-bau-Ø
cut-AUG-IRR-DDF-OBJ IMPS SG-bring-here-RL
That which is cut, bring it here.

APPENDIX

Table of Object Markers

verb root	definition	SG.dim.	SG.Aug.	DU	PL	Many
mint	crush, step on there	*an*	*er*	*an*	*as*	*akw-ari*
me~men	step on	*me-an*		*me-an*	*men-tas*	*men-tas*
o~et	carry (carry one bunch of arrows away)	*o-nc*	*o-n*	*o-nc*	*et-eret*	*et-eret*
o~et	carry (stones)	*o-net*	*o-ret*	*o-nc*	*et-eret*	*et-eret*
kwa	lift bucket	*n*	*r*	*n*	*arari*	*Ø*
o~s	pick up stones	*o-ni*	*o-ri*	*o-ni*	*et-ari*	*et-ari*
wa	see	*nï*	*rï*	*nï*	*ngkw-ari*	*ngkw-ari*
be	drink	*n*	*n*	*n*	*n-ari*	*n-ari*
maka	cut grass	*n*	*n*	*n*	*n-ari*	*n-ari*
memot	wring out	*an*	*eri*	*an*	*ari*	*ari*
te	pour (liquid)	*n*	*r*	*n*	*ngkw-ari*	*ngkw-ari*
ra	roast (on fire)	*en*	*n*	*en*	*ntïs*	*ntïs*
ko~et	eat meats	*et-an*	*ko-n*	*et-an*	*ko-ntïs*	*ko-n-ari*

verb root	definition	SG.dim.	SG.Aug.	DU	PL	Many
na	eat non-meats	*n*	*n*	*n*	*n-ari*	*n-ari*
	go somewhere and eat a variety of foods					*nanarikum*
	go from place to place eating					*nanarinakum*
wa~at	put/place	*wa-ny*	*wa-rn*	*wa-ny*	*at-esi*	*at-erina-ku*
kame	pat	*etu*	*is*	*etu*	*etukw-ari~ari*	
mantere	go around	*etu*	*es*	*etu*	*etukw-ari*	*eretu*
toba	trick	*arï*	*is*	*atu*	*atukw-ari*	*atukw-ari*
takwe	back & forth	*etu*	*esa*	*etu*	*etukw-ari*	*etukw-ari*
bara	tie	*at*	*as*	*at*	*atukw-ari*	
bara	reprimand	*atu*	*as*	*atu*	*atukw-ari*	*atukw-ari*
k	help	*engku*	*ais*	*engku*	*engkw-ari*	*engkw-ari*
mentie	not understand	*engku*	*es*	*engku~entum*	*engkw-ari*	*engkw-ari*
owe	tell story	*enu*	*es/eri*	*enu*	*engkw-ari*	*engkw-ari*
ment	squeeze	*an*	*er*	*an*	*ari*	*ari*
menta	press down	*ari*	*es*	*ani*	*angkw-ari*	*angkw-ari*
wa	watch	*nï*	*s*	*nï*	*ngkw-ari*	*ngkw-ari*
tuku	throw, toss	*n*	*esi*	*n*	*rar-ari*	*rarasiam*
tuku	throw a ball cast a fishing hook	*anu*	*ïs*	*anu~anunaku*	*ar-ari*	*ararina-ku*
tïk	break a small object	*kw-oarec*		*kw-arec*	*kw-ari*	*kïnac*
tïk	break a large object		*an*		*ar-ari*	*kar-ari*
ai	turn over	*kw-oari*	*ri*	*kw-ari*	*tu*	*tekw*
bora	roll	*kw-aric*	*si*	*kw-aric*	*tekw~tu*	*tekw-(ari)*
moka	wash	*kw-oari*	*ri*	*kw-ari*	*ar-ari*	*ar-ari*
taka	wash food	*kw-arï*	*ri*	*kw-arï*	*ar-ari*	*ar-ari*
kot	cut	*oari*	*ri*	*oari*	*ar-ari*	*arasi*
bwak	slit, split up	*oarï*	*ri*	*oarï*	*wari*	*wïs*
sok	break	*oari*	*ri*	*oari*	*ari*	*ari*
tarab	hang out clothes	*oarï*	*ai*	*oarï*	*an*	*ari*
kwamo	hide something in a bag	*oarï*	*r*	*oarï*	*ari*	*ari*
sibot	open a door		*ï*	*ï*	*n*	*n*
ati	close a door		*n*	*n*	*riri*	
ki	put up a roof		*n*	*n*	*c-ari*	
si	sew	*en*	*enca*	*en*	*er-eri*	*er-eri*
tataw	scratch (multiple action)	*en*	*ai*	*en*	*er-erï*	*ai*
mut	crinkle up	*in*	*in*	*in*	*erer*	
mutïti	crinkle	*en*	*em*	*en*	*ari*	*er-eri*
itatie	fix	*n*	*e*	*in*	*ri*	*ri*
ewi~ekwar~eba	follow	*ekw-oarec*	*ewi-si*	*ekwar-ec*	*eba-si*	*eba-si*
bari(k)	open	*oaric*	*ïsi*	*ki-oari*	*ari*	*arina-ku*
bw	pick coconuts off trees	*in*	*ai*	*in*	*en*	*en*
bw	pick coconuts off one tree	*atï*	*erï*	*atï*	*en*	*ai*
tab	make	*at(ï)*	*ar(ï)*	*at(ï)*	*ar-ari*	*ari~ar-ari*
kob	crack open	*(ar)*	*ari*	*ati*	*ar-ari*	*ar-ari*
kirib	stab	*ati*	*erï*	*ati*	*ari*	*ari*
swengk	cut down a stalk of bananas	*ati*	*ïrï*	*ati*	*ari*	*wie*
tïk	pick (break off) flower	*atï*	*erï*	*arï~aras*	*eri*	*eri*

verb root	definition	SG.dim.	SG.Aug.	DU	PL	Many
tik	pick (break off) pandanus	*ati*	*eri*	*ati*	*an*	*an*
tik	pick vegetables (break off)	*ati*	*erim*	*ati*	*aras*	*aras*
erak	carve arrow	*ati*	*eri*	*ati*	*ari*	*ari*
kwic	burn off	*eti*	*eri*	*eti*	*etekw*	*etekw*
kyi(c)	burn down	*ky-in*	*an*	*ky-in*	*ari*	*ari*
bos	pull up	*at*	*eri*	*at*	*Ø*	*Ø*
mes~mesi	to fix	*iatu*	*eri*	*iatekw*	*iatukw-ari*	*iatukw-ari*
bac	read	*ekw-ari*	*eri*	*ekw-ari*	*etukw-ari*	*etukw-ari*
war~mis~s	put in	*mis-in*	*wari-an*	*mi-n*(lrg)	*sar-ari*	*sar-ari*
buc~bw~ma	cut down tree	*bw-in*	*buc-en*	*bw-in*	*mar*	*mar*
tac~u~orien	shoot, kill	*u-ni*	*tac-an*	*u-ni*	*orien*	*orien*
bab~tumw	plant, pound, place	*bab-in*	*bab-an*	*bab-in*	*tumw-an*	*tumw-an*
sebab	wake up, sit up	*on*	*on*	*on*	*seb-na-ku*	*seba-net*
man~kw	divide	*ti*	*ti*	*ti*	*ti~kw-Ø*	*ti*
siso(k)	to touch		*ri*	*k-oari*	*kw-ari*	*tuk-oari*
mes	fix	*ukwer*	*er*	*ukwer*	*iat*	
wa	read, look	*ri*	*sam*	*nekw*	*ngkw-ari*	*ngkw-ari*
kwa	carry water	*r*	*ri*	*m*	*m*	*m*
kwa	to dip water	*ri*	*riny*	*ri*	*m*	*ari*
warian~mesen	cook	*mesen*	*warian*	*mesen*	*warian*	*warian-tis*
taba	cut many items	*tekw*	*ri*	*tekw*	*t-ari*	*rin(aku)*
kar	start a fire	*an*	*Ø*	*an*	*as-atu*	*atu*
mocak~mocik	tear	*in*	*ie*	*in*	*ari*	*ari*
sib	scrape, shave	*an*	*Ø*	*an*	*ari*	*ari*
misik	split wood	*in*	*i*	*in*	*ari*	*aria*
ab	pound nails	*in*	*i*	*in*	*er-eri*	*er-eri*
kwi	cut up meat	*en*	*e*	*en*	*eri*	*eri*
tow	tie up	*in*	*ie*	*in*	*ri*	*ri*
ser	tell, say	*in*	*i*	*in*	*eri*	*eri*
bwak	chop firewood		*i*	*in*	*ar*	
		wari	*ri*	*wari*	*ari*	*ari*
ti	give food		*Ø*	*en*	*er*	
		en	*e*	*en*	*eri*	*eri*
kor	write, carve	*en*	*ie*	*en*	*er-eri*	*er-eri*
tow	fill with water	*an*	*Ø*	*an*	*ar-ari*	*ar-ari*
kak	carve	*an*	*Ø*	*an*	*ar-ari*	*ar-ari*
was~ab	hit	*was-in*	*was-an*	*was-in*	*ab-er*	*ab-erina-ku*
	go hitting	*was-ina-ku*	*was-ana-ku*		*ab-erana-ku*	
ca	chase	*an*	*Ø*	*an*	*ar-ari*	
ca	chase away	*an-ku*	*a-ku*	*an-ku*		
warint	place flooring		*Ø*	*wanyet*	*aterita*	
kor	lick	*en*	*ai*	*en*	*eri*	*eri*
en	sharpen	*in*	*ai*	*in*	*er-eri*	
bor	roll a potato	*r*	*r*	*ran*	*ar-ari*	*ar-ari*
		ekw-aric	*asi*	*ekw-aric*	*atuw-ari*	*atukw-ari*
iri	cut back and forth		*ai*	*n*	*etukwar*	

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HATAM PHONOLOGY AND GRAMMATICAL NOTES

MARK DONOHUE

1. INTRODUCTION

A phonological analysis is presented for Hatam, a non-Austronesian language spoken south of Manokwari on the north-eastern tip of the Bird's Head Peninsula, Irian Jaya. The analysis shares some features in common with analyses previously proposed for Kalam (Schrader ranges, Papua New Guinea), Haruai (Western Schraders, PNG), and Irarutu (Voorhoeve 1989), and reference is made to these analyses. Some basic grammatical information is presented, as well as a wordlist.

1.1 PREVIOUS STUDIES

There have been no previous studies on the Hatam language, beyond the collection of wordlists. Indeed, the existence of Hatam as a language separate from Mantion or Meyah has been overlooked by some writers. Cowan, in his survey of the languages of north and east Irian (1953) appears to have missed Hatam – he noted the existence of a "Mansibabêr" in the hinterland behind Manokwari and behind the area south from there,[1] indicating the approximate Hatam language area, but the notes he gives on this language point to it being included in the East Bird's Head Phylum (see below), probably as a dialect of Meyah. Galis (1955) published a short wordlist in the Hatam language (Number 34; his wordlist consisted of thirty words, of which fourteen were numbers), and included a map. Voorhoeve (1975a), working from this material and unpublished wordlists collected by Anceaux, published a longer (forty item) wordlist, and classified it accordingly as part of the West Papuan Phylum.

1.2 CLASSIFICATION

Hatam has been classified by Voorhoeve (1975a; 1975b) under the name *Hattam* as an isolate in the West Papuan Phylum, but its very low lexical resemblance to the other, non-contiguous languages of the other stocks in the Phylum has made this early classification appear tenuous (Voorhoeve, pers.comm.). Geographically, Hatam is separated from the languages of the West Papuan Phylum by speakers of Meyah (Meax), a language of the East Bird's Head phylum spoken from the north coast near Manokwari south through the Merdei range. In the south, Hatam is bordered by the Sougb dialect of Manikion, also a language of the East Bird's Head phylum, near the northern side of Anggi Giji lake.

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1 Original quote: "Mansibabêr 3), gesproken in het achterland achter Manokwari en achter de streek ten Zuiden daarvan." (p.8)

Andrew Pawley, ed. *Papers in Papuan linguistics No.3*, 37-57.
Pacific Linguistics, A-87, 1997.
© Mark Donohue

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A-87:37-57. Pacific Linguistics, The Australian National University, 1997. DOI:*10.15144/PL-A87.37*
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1.3 MISCELLANEOUS

I noted dialectal differences between the Minyambow and Anggi informants, mainly in the area of pronunciation and in a few lexical items, but the differences are not very great. The differences between these two speech varieties are not nearly as great as those between Hatam and the unrelated Meyah and Manikion, its western and southern neighbours. There does appear to be a consistent s/h correspondence between the Anggi dialect and the Moile dialect. Compare the following words:

TABLE 1: ANGGI-MOILE h/s CORRESPONDENCES

	Anggi	Moile
bird	*hap*	*sap*
earth	*tyhey*	*syey tyoy*
smoke	*hm mwp*	*sm mwp*

This could be the result of influence from the Manikion language, the Sougb dialect of which is spoken around the Anggi lakes, and which shows an abundance of /h/s. A further difference in pronominal use is discussed in section 3.1.

These notes were gathered during a short trip to the language area in August 1991, from informants from the Minyambow area in the centre of the Hatam area, and from around the Anggi district, in the extreme south of the language area. Additional (mainly lexical) data was gathered from tapes kindly supplied by Dr Voorhoeve, made on a survey trip that he conducted in 1982. All references to the Moile and Tinam dialects stem from the tapes that he made available, and sentences taken from his tapes are marked with (V.)[2] after the sentence.

2. PHONOLOGY

The phonological analysis presented here is similar to that adopted by Pawley for Kalam (1966), and for several languages of the Sepik and Ramu area (see Laycock 1991, Comrie 1991), in which there are no phonemic high vowels; realisations of [i] and [u] are assumed to be allophonic vowel variants influenced by an adjoining /y/ or /w/, respectively. This is motivated mainly by some rules of consonant lenition and data from the northern dialect in which the [i] and [u] vowels are often not present, pointing to their non-phonemic status. I

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2 The following abbreviations are used:

A	agent	PF	perfective
(A.)	Anggi	PL	plural
BEN	benefactive	POSS	possessive
DU	dual	Q	question word
FUT	future	REL	relativiser
HORT	hortatory	S	subject
LOC	locative	SG	singular
(M.)	Moile	(v.)	verb
Mal.	Malay	(V.)	Voorhoeve texts
NEG	negative	VOC	Vocative
O	object	w/s.t.	with something

shall use the conventions of the International Phonetic Association in the presentation of material enclosed in phonetic brackets [ ].

2.1 CONSONANTAL PHONEMES

The consonant phonemes of Hatam are as set out in the Table 2. There are five contrasts in place of articulation for the stops, and they show a three-way contrast in manner of articulation: plain, prenasalised and nasal.

TABLE 2: HATAM CONSONANTS

	Labial	Alveolar	Palatal	Velar	Labio-velar	Glottal
Plain	p	t	c	k	k͡p	
Prenasalised	b	d	j	g	g͡b	
Nasal	m	n	ɲ	ŋ	m͡ŋ	
Continuant		s				h
Sonorant		r				
Semi-vowel			y	w		

The various allophonic rules governing the realisations of the consonantal phonemes are presented below. Where no explicit environment is given, the forms are in free variation. Considerable allophony allows most of the allophones to occur in most of the environments; the form listed for each environment is the majority allophone in that environment.

/p/ Bilabial obstruent
→ [β] / V__V
→ [pɸ], [ɸ] / #__
→ [b], [p]

/b/ Prenasalised bilabial obstruent
→ [mb], [mp]

/t/ Alveo-dental obstruent
→ [d], [t]

/d/ Prenasalised alveo-dental obstruent
→ [nd], [nt]

/c/ Palatal obstruent
→ [j], / V__V
→ [ɟ], [dʒ], [dz], [tʃ], [ts]

/j/ Prenasalised palatal obstruent
→ [ɲdʒ], [ɲdz], [ntʃ], [nts]

/k/ Velar obstruent
→ [q] / __V [+back]
→ [ɣ] / V__V
→ [g], [k]

/g/ Prenasalised velar obstruent
→ [ŋg], [ŋk]

/k͡p/ Labio-velar obstruent
→ [g͡b], [k͡p]

/g͡b/ Prenasalised labio-velar obstruent
→ [mŋ͡gb], [mŋ͡kp]

All the stops above are unreleased if syllable final and no vowel is added.

/m/ Bilabial nasal sonorant
→ [m]

/n/ Alveo-dental nasal sonorant
→ [n]

/ɲ/ Palatal nasal sonorant
→ [ɲ]

/ŋ/ Velar nasal sonorant
→ [ŋ]

/mŋ͡/ Labio-velar nasal sonorant
→ [mŋ͡]

/s/ Alveolar fricative
→ [s], [z]

/r/ Alveolar tap/flap
→ [r], [l], [ɾ], [ɻ]

/h/ Glottal fricative
→ [h]

/w/ Labio-velar approximant
→ [w], [β] (but see section 2.4)

/y/ Palatal approximant
→ [j], [ʑ] (but see section 2.4)
→ [dʒ] / y__

2.2 VOWEL PHONEME CHART

The vowels of Hatam are displayed in Table 3. They contrast in height and backness.

TABLE 3: HATAM VOWELS

	Front	Back
Mid	ɛ	ɔ
Low	a	

Basic vowel allophony is straightforward:

/o/	→	[ɔ], [o]		
/e/	→	[ɛ]		
/a/	→	[ɑ]	/	__C [+back]
		[æ]	/	__C [+front]
		[a]	/	elsewhere
V	→	Vˆ	/	C [+high]
V	→	V^{w}	/	C [+back]

2.3 EPENTHETIC VOWELS AND THE BREAKING UP OF CONSONANT CLUSTERS

The great number of (phonological) consonant clusters are accounted for by a rule of epenthetic vowel insertion between (most) adjacent consonants. Allowed consonant clusters in the dialect of Singgenia (north Anggi lakes area) are:

TABLE 4: CONSONANT CLUSTERS

Initial:	kw	gw	ŋw	hw	pr	tr	kr	br	(dr)	gr
Medial:	kw	gw	ŋw	sw	pr	tr	kr	br	dr	gr
	wC		yC							
Final:	wC		yC							

Notice how /hw/ initially patterns with /sw/ medially as allowed consonant clusters, pointing again to their common origin.

Between all other consonant clusters the following rule of epenthetic vowel insertion applies:

CC → C*i*C

Thus in the Hatam word *tŋat* 'I see', the following derivation occurs:

Phonemically	/t-ŋat/	I see
Vowel insertion	{tɨŋat}	
Phonetic output	[dɨˈŋɑt] (or [tɨˈŋɑt], amongst other possibilities)	

In the Minyambow dialect, especially in the case of two consonants both preceded and followed by a vowel, many clusters that would be disallowed in Anggi are not separated by this epenthetic vowel. Compare the word for 'fourteen' in the two dialects:

	Minyambow	Anggi-Singgenia
Phonemically	/prymykp͡tay/	/prymykp͡tay/
Vowel insertion	{prɨymɨykp͡tay}	{prɨymɨykp͡ɨtay}
Vowel modification	{prɪmɪkp͡taj}	{prɪmɪkp͡ɨtaj}
Phonetic output	[ˌprɪmɪgb͡ˈtaj]	[ˌprɪmɪgb͡ɨˈtaj]

The epenthetic vowel is subject to considerable variation, depending on the surrounding segments. This can be towards the palatal region, before palatal consonants:

Phonemically	/kdy/ elder sibling	/myc/ foot
Vowel insertion	{kɨdɨy}	{mɨyɨc}
Vowel modification	{kɨdɪy}	{miyc}
Phonetic output	[kɨˈndɪj]	[ˈmiʲʤɐ]

In the environment of a labial or velar consonant, the vowel is backed:

Phonemically	/krw/ thunder	/mbwc/ cloud
Vowel insertion	{krɨw}	{mɨbɨwc}
Vowel modification	{kruw}	{mɷbuwc}
Phonetic output	[ˈkruwɐ]	[mɷˈmbuʷʤɐ]

Adjacent to an alveolar consonant, it tends to be fronted and lowered:

Phonemically	/tgm/ I'm hungry	/tmay/ butterfly
Vowel insertion	{tɨgɨm}	{tɨmay}
Vowel modification	{tɛgɷm}	{tɛmay}
Phonetic output	[dɛˈŋgɷm] ~ [dɨˈŋgɷm]	[dɛˈmajɐ] ~ [dɨˈmajɐ]

Notice the syntactically conditioned rule that optionally adds a low vowel after a final consonant of nouns[3] which are not the subject of the clause in which they appear, before a pause or in deliberate, slow speech:

C → Ca / __# (nouns)

The range of phonetic spread shown by the epenthetic [ɨ] sound can be summarised as follows:

[ɨ]	→	ɪ	/		__ y, c, ñ
	→	i	/	y, c, ñ	__
	→	ɷ	/		__ h, k, ŋ
	→	u	/	h, k, ŋ	__, __ w, p, m

3 It does not appear that verbs or pronouns are bound to this rule, thus implying that it has some grammatical basis, but the environments in which it does or does not occur have proved elusive, so it is here described as a phonological property.

→	ə	/	w, p, m	__
→	ɛ	/	s, t, n	__
→	a	/		__#

It will be obvious that most of the above environments can occur in combination; for instance, in the word 'I see', /tŋat/, becoming {tɨŋat} after [ɨ] insertion, the [ɨ] is in the environments to be modified to a [u] or a [ɛ]. Rather than being taken as absolute indications of the realisation of the sound, these should be taken as an indication of the range of spread of the sound; thus the [ɨ] in the example above can be realised anywhere in the phonetic space between [ɛ] and [u], with a tendency to remain unmarked and centralised as [ɨ] or [ə].

These rules do *not* need to be ordered so that a peripheral glide has less affect on the vowel than an interior one; in the case of the word for path, *pwy*, there is no vowel insertion between the w and the y, as this is an allowed cluster in word-final position:

Phonemically	/pwy/ path
Vowel insertion	{pɨwy}
Vowel modification	{pɷwy}
Phonetic output	['pΦujɐ]

Different phonotactic constraints at different parts of the word can lead to different phonetic outputs for the same phonemic sequence of consonants; compare the sequence /wy/ in 'path', above, example and in 'banana', following:

Phonemically	/wyt/ banana
Vowel insertion	{wɨyt}
Vowel modification	{wiyt}
Phonetic output	['wi̯dɐ]

Word-finally /w/ and /y/ can form a cluster, as in *pwy* 'path', but initially they cannot, and so an epenthetic vowel is inserted between them. The /y/ can form a cluster with the following /t/ in *wyt*. Note that the following /y/ has a much greater influence on the phonetic character of the epenthetic vowel than does the preceding /w/.

For the purposes of the allophonic rules given for consonants the epenthetic [ɨ] is not a vowel; that is, being surrounded by the [ɨ] sound does not suffice to lenite /p/ to [β] or /k/ to [ɣ]. Compare the phonetic behaviour of the /k/ phonemes in the following two cases:

Phonemically	/pketa/ rain	/yhakom/ all
Vowel insertion	{pɨkɨt}	{yɨhakom}
Vowel modification	{pəkɛt}	{yɪhakom}
Phonetic output	[pə'gɛda]	[jɪ'hɑɣɔm]

In the case of *pketa*, the environment for lenition of the /k/ is not met, as it is not preceded by a vowel at a phonemic level, but by another consonant, the /p/. The /k/ in *yhakom*, however, is both preceded and followed by phonemic vowels, /a/ and /o/, and thus is in a suitable environment to allow it to lenite to [ɣ].

2.4 THE SOUNDS [i] AND [u]

Now that the need for the general, epenthetic vowel has been established by the above, the reasons behind the treatment of [i] and [u] as arising from the /y/ and /w/ phonemes can be addressed.

Regular rules account for the modification of this epenthetic vowel to give it the phonetic values [i] and [u] in environments contiguous to a palatal or labial/velar consonant, respectively. Examples are:

Phonemically	/mcm/ spear	/hm/ fire
Vowel insertion	{mɨcɨm}	{hɨm}
Vowel modification	{mɪcɪm}	{hɷm}
Phonetic output	['mɪdʒɪmɐ]	['hɷmɐ]

These phonetic vowels differ from 'true' (phonemic) vowels in several ways. Firstly, they are subject to variation and even deletion, as outlined in the previous section. The word *mñey* 'water', has the following variants:

/mñey/ [mɨ̆ˈɲejɐ] ~ [mɪ̆ˈɲejɐ] ~ [mʊ̆ˈɲeyɐ] ~ [mˈɲejɐ]

The high front vowel varies over a considerable range of the vowel chart, and can be completely absent. The only things that these forms all have in common are the consonantal values, the /e/ vowel, and the stress. The stress is especially important for determining the phonological status of words of the form /Cy(C)/ or /Cw(C)/, which are analysed as not containing any phonemic vowels. This analysis is supported by the reduced stress that accrues on these words when compared to CV(C) words. The stress is noticeably stronger on words containing [ɛ], [a] or [ɔ] than [i] or [u]. Compare the following:

/pet/	moon	['bɛːdɐ]
/cow/	nipah palm	['tʃɔːwɐ]
/jap/	tomorrow	['ndʒaːβɐ]
/mwn/	night, dark	[ˌmɷʷnɐ]
/syn/	small crow	[ˌsʊ̈nɐ]

Finally, when compounded the epenthetic vowel appears to be purely conditioned, and not basic to either of the components of the compound:

d-prak	left hand	[ə̆ndɐˈɸraːɣɐ]	(< *dp*	[ə̆ˌndɐpə] + *prak*	['ɸrakɐ])
d-com	right hand	[ə̆ndɪˈtʃɔːmɐ]	(< *dp*	[ə̆ˌndɐpə] + *com*	['tʃɔmɐ])

2.5 HATAM AND KALAM COMPARED: EPENTHETIC VOWELS

Although the phonological rules for the generation of [i] and [u] segments through an epenthetic {ɨ} vowel that apply for Hatam are almost identical with the rules that Pawley posits for Kalam, the phonetic realisations are somewhat different. In Hatam, there are often traces of the non-vocalic element at the peripheries of the phonetically vocalic segment, realised as strong post-vocalic frication in the place of articulation of the semi-vowel. Furthermore, the factors conditioning the quality of the vowel produced are not always absolute. By contrast, in Kalam the /y/ and /w/ phonemes always produce [i] and [u] vowels between two consonants (Pawley, pers.comm.). Compare the sequence *Cyt* in both Hatam and Kalam:

	Hatam	Kalam
Phonemically	/wyt/ banana	/pyt/ bamboo knife
Vowel insertion	{wɨyt}	{ }
Vowel modification	{wiyt}	{ }
Phonetic output	['wɨ̯dɐ] ~ ['wɨ̯dɐ]	[ɸiř]

In Kalam, the semi-vowel /y/ loses all of its consonantal characteristics between consonants, whilst the Hatam /y/, in addition to modifying the epenthetic vowel, is often preserved as a fricative element after the vowel, unless it precedes a following semi-vowel (see *pwy* above).

A further difference lies in the case of long vowels that are in Kalam analysed as a sequence of two semi-vowels; the word [kuːř] ~ [kɷwɷř] 'k.o. bird' is analysed as /kwwt/; nothing of this sort exists in Hatam, the rules for consonant cluster reduction predicting that the first of the transcribed forms given above would arise from /kwr/; the second, [kɷwɷř], is not found in Hatam. Forms with a /yy/ sequence appear to be rare in Kalam; some are found, arising from verbal affixes, forms such as *agyyak* arise:

agy-y-ak	They cooked.
cook-they-past	[ɐŋgijak]

in which the interpretation of the two *y*s seems to be in question, the two possibly collapsing to a single *y*, as the (hypothetical) *agyak* would have the same pronunciation (Pawley, pers.comm.). In Hatam, a sequence of two *y*s can arise only through affixing morphology, and in that case the second of the two phonemic *y*s dissimilates to become a stop:

y-yem	They eat.	*y-y*	Their house.
3PL-eat	[ɻ'dʒɛm]	3PL-house	[ɪdʒɐ]

It can be seen that whilst the phonological inventories of phonemes is quite similar for Hatam and Kalam, the application of certain of these rules is quite different in the two languages. This is particularly obvious when a sequence of two unlike semivowels occurs. Compare the sequence *Cwy* in Hatam and Kalam:

	Hatam	Kalam
Phonemically	/pwy/ path	/kwy/ odour
Vowel insertion	{pɨwy}	
Vowel modification	{pɷwy}	
Phonetic output	['p$^{\Phi}$ujɐ]	[kyj]

Clearly *Cwy* produces a more complex output in Kalam than is the case in Hatam; not only is the *w* made syllabic, but it is also fronted, assimilating in place to the *y*. In Hatam this is not the case, and the *w* becomes syllabic, but the resulting vowel is not affectd by the following *y* since the regularly inserted {ɨ} was never in contact with it. Kalam appears to have more complex rules of interaction for the syllabification of its semi-vowels than is the case in Hatam. In Hatam, a semivowel fully syllabifies before *any* other consonant, whereas in Kalam the process of syllabification depends on whether or not the following consonant is a semivowel or not. Note also that the rules given here for semivowel syllabification in Hatam dissallow [Cwi] and [Cju] as possible phonetic realisations of Hatam forms that would be represented phonemically as /Cwy/ and /Cyw/; they would be realised instead as [Cuj] and [Ciw], respectively.

3. GRAMMATICAL OUTLINE

3.1 PRONOMINAL FORMS

Pronominal prefixes mark the identity of the subject on the verb, and are also used to indicate some forms of possession on a noun. The forms of these prefixes are set out in Table 5.

TABLE 5: PRONOMINAL PREFIXES

	SG	DU	PL
1	*t-*	*s-*	*ñ-*
2	*a-*		*c-*
3	*Ø-*		*y-*

Most of these are transparently derived from the initial consonant of the independent pronouns:

TABLE 6: PRONOUNS

	SG	DU	PL
1	*tany*	*sany*	*ñeny*
2	*nany*		*ceny*
3	*nony*		*yony*

In the Moile dialect the 3PL form *yony* has dropped in favour of the 2PL form *ceny*.

There are short forms of all of these pronouns, being identical to the long form but lacking the final *ny*; these are used in unemphatic positions as either subject or object. Noteworthy about the Hatam pronominal set is that there is no Dual-Plural distinction available for the second and first person forms, although there is a distinction made between the two persons.

The prefixes are obligatorily used on verbs to indicate the subject of that verb:

(1) *Tany t-ŋat noni Ø-yem pas.*
I 1SG-see s/he 3SG-eat rice
I saw him eating rice.

The same prefixes can also be used to show possession, when used with inalienable/kin-term nouns:

(2) a. *cy* father b. *t-cy* my father
father 1SG-father

When used with alienable/non-kin items, a possessive construction *-te-* must come between the prefix and the noun:

(3) a. *t-te-y* my house
1SG-POSS-house (V.)

b. **t-ykpey*
1SG-house

3.2 DEMONSTRATIVES

The demonstrative system of Hatam shows a distinction in the third person forms based on the elevation of the referent relative to the speaker. The forms are as follows:

here	*s-ny*	this	*t-ny*
there	*s-ma*	that	*t-ma*
yonder	*s-nw*	yon	*t-nw*
yonder.lower	*s-mw*	yon.lower	*t-mw*
yonder.higher	*s-hw*	yon.higher	*t-hw*

3.3 ANAPHORA AND DELETION

Simple transitive clauses show SVO order and pronominal prefixing on the verb:

(4) *Tany t-ŋat nany.*
I 1SG-see you
I saw you.

(5) *Tany t-yem pas-a.*
I 1SG-eat rice
I eat/ate rice.

Conjoining two clauses with a coreferential agent requires the use of the infix *-ho-:*

(6) *Tany t-ho-ŋat nany pa t-yem pas-a.*
I 1SG-ho-see you and 1SG-eat rice
I saw you and then I ate rice.

The use of *-ho-* is necessary only if there are coreferential *agents*, not subjects; if one of the arguments is the subject of an intransitive verb, and not the agent of a transitive verb, then the infix *-ho-* is not required to show coreferentiality:

A → S

(7) *Tany t-ŋat pɪyeta t-w swtegbey.*
I 1SG-see night.demon 1SG-go Sutebei
I saw the demon and went to Sutebei.

S → S

(8) *Nony ø-ha mñey pa ø-ykraw mswon-a.*
s/he 3SG-swim water and 3SG-arrive lake
He swam in the river and so arrived at the lake.

S → A

(9) *Nony ø-poŋ tw lew ø-yem pas-a tw.*
s/he 3SG-sleep PF from 3SG-eat rice PF
He had already slept and then ate rice.

Without the *-ho-* infix, the interpretation of two conjoined transitive clauses cannot be that the agent of the first is identically coreferential with the agent of the second:

(10) *Pryeta Ø-ŋat nony lene Ø-yem pkaw-a.*
night.demon 3SG-see he and 3SG-eat sweet.potato
The demon$_1$ saw him$_2$ and then he$_2$ ate a sweet potato.
*The demon$_1$ saw him$_2$ and then he$_1$ ate a sweet potato.

(11) *Tany t-ŋat noni pa ñeny ñ-yem pas-a tw.*
I 1SG-see s/he and we.PL 1PL-eat rice PF
I saw you and then we ate some rice.

(12) *Tany t-ho-ŋat nany pa t-kwam yk͡pe.*
I 1SG-see you and 1SG-sit house
I saw you when I was occupying the house.

To summarise the restrictions on coreference, there appears to be an [S, A] pivot, except in the case that both the arguments are agents; in that case they are treated differently by the morphology, the verb obligatorily taking the infix *-ho-*. This could be viewed as a form of ergativity, isolating the A function from S and O as it does, but the operation of a [S, A] pivot is also clear from examples (7) to (9).

3.4 CASES, ASPECT, NEGATION AND COMMANDS

Core cases are not explicitly marked: SVO word order makes the role of the arguments clear. There is a 'half-case' in the form of the epenthetic vowel that can be added to nouns in non-subject position. The addition of this *-a* is, as far as I could determine from the limited data, optional, but it was never observed on a noun in subject position. It may be a case marker in the process of evolving, as it is certainly more real than the epenthetic {ɨ}s that are inserted between consonants, since it functions as a vowel for the purposes of lenition. The *-a* is marked where it was heard in sentences, but not glossed.

The case-marking postposition *lew*[4] is used in both the ablative sense of 'from' in spatial modification, as well as in the temporal senses of 'after' and 'because' when co-ordinating clauses:

(13) *Tany t-kwe lew mswon-ty.*
I 1SG-come from lake-LOC
I came from the lake.

(14) *Non Ø-poŋ tw, lew Ø-yem pas-a tw.*
s/he 3SG-sleep PF from 3SG-eat rice PF
He slept, after eating the rice.

(15) *Ta t-ŋat nany lew maw tot tany.*
I 1SG-see you from not.FUT cut I
I saw you (first), so you didn't cut me.

---

4 Logically this should be written *rew*; I have written it as *lew* because I have not heard it vary with [r].

(16) *Kon tc, noro pc lew phm.*
carry stone succeed not from heavy
(Come and) carry this stone, I can't (lift it) because it's (too) heavy. (V.)

Local suffixes *-y* and *-typ*, the second containing the additional meaning 'on, above' are suffixed to the word that they modify. The general locative *-y* shows considerable allomorphic variation, appearing with a stop (perhaps homo-organic to a preceding consonant, although the data is insufficient to make a definitive statement) when attached to a word ending in a consonant; see (11) above. This suffix is optional with negative statements (see (18), (19) with (23), (24) and (25)):

(17) *Tany t-kwam meca-typ.*
I 1SG-sit chair-on
I am sitting on the chair.

(18) *Nony ø-kwam yk͡pe-y.*
s/he 3SG-sit house-LOC
She is sitting in the house.

(19) *Ñeny ñ-cwk mñey-sy.*
We.PL 1PL-descend water-LOC
We are going down to the river. (V.)

Benefactives can be expressed through the particle *yp* appearing before the affected NP; this will occur after the theme/ direct object:

(20) *Nony ø-yay pkaw yp ta.*
s/he 3SG-give sweet.potato BEN I
He gave the sweet potato to me. (V.)

This benefactive NP may be used without the direct object appearing:

(21) *Tany t-yay yp yony tw.*
I 1SG-give BEN they PF
I've already given (it) to them. (V.)

Conditionals are presented as juxtaposed clauses; notice the aspect particle *to* that occurs phrase-finally to show the perfective:

(22) *Ŋey tw t-w mwcr-ry.*
hot PF 1SG-go Ransiki-LOC
If it's hot I'll go to Ransiki.

A negative statement can be made by using the particle *pc* phrase-finally:

(23) *Tany t-w mswon-ty pc.*
I 1SG-go lake-LOC not
I'm not going to the lake.

(24) *Pket-a pa tany t-w mwcr pc.*
rain and I 1SG-go Ransiki not
If it rains I won't go to Ransiki.

Notice that the *pc* in (24) does not modify the whole sentence, but only the last clause. Compare with (25):

(25) *Pket-a pc tany t-w mwcr-ry.*
rain not I 1SG-go Ransiki-LOC
If it doesn't rain I'll go to Ransiki.

This can be expanded into 'not yet' with the addition of *-o:*

(26) *Tany t-ŋat no pc-o.*
I 1SG-see s/he not-yet
I haven't seen him yet.

(27) *Nony ø-kwe pc-o.*
s/he 3SG-come not-yet
He hasn't arrived yet. (V.)

Strong denials can be made with a further negative infix *-n-* in the verb:

(28) *T-n-gwen pc.*
1SG-NEG-sick not
I'm *not* sick.

(29) a. *Key!*
ø-key
3SG-good
(That's) good!

b. *Kney!*
ø-k-n-ey
3SG-NEG-good
(That's) bad!

Commands are formed by using the un-inflected verb form for a positive command, and the negator *maw* plus an inflected form for prohibition:

(30) *W!*
go
Go!

(31) *Maw a-pym.*
not.FUT 2SG-cry
Don't cry!

3.5 MODIFICATION

Adverbial or instrumental elements are separate clauses:

(32) *Tany (t-pap oya) t-rok pyey-a.*
I 1SG-use axe 1SG-cut wood
I cut wood (with an axe).

(33) *Tany t-pry kapar tbar t-w mwcr.*
I 1SG-board airplane 1SG-go Ransiki
I am going to fly to Ransiki.

(34) *Tany t-kow t-yem pkaw-a.*
I 1SG-not.want 1SG-eat sweet.potato
I don't want to eat sweet potato.

There appears to be a causative prefix:

(35) a. *cwt* b. *pde-cwt*
fall drop (*pde* ([pɨ'ndɛ]? < Malay *pande*)

Modifiers of a noun appear as verbal elements after the noun, joined by the (relative clause?) marker *n-*:

(36) *Tany t-ŋat nap-a n-dc.*
I 1SG-see pig REL-big
I see a big pig.

(37) *Tany t-ŋat nap-a n-myen.*
I 1SG-see pig REL-small
I see a small pig.

Numbers can modify a noun by appearing after other modifiers, or by being joined with the prefix *n-*:

(38) *Tany t-ŋat nap n-myen can.*
I 1SG-see pig REL-small two
I can see two small pigs.

(39) *Pryeta n-kom ø-yem pkaw-a.*
night.ghost REL-one 3SG-eat sweet.potato
The night ghost ate the sweet potato on its own.

In this same position we find *maŋ* 'many', *poy* 'some' and *yhakom* 'all'. Demonstratives appear after the noun, but it is unclear where they appear with respect to other modifiers of a noun (but see (43)).

The relativiser is also found with some common nouns that could be considered part-of-whole elements:

(40) a. *n-gramty* b. *n-meŋ* c. *n-gryp*
REL-branch REL-leaf REL-seed

One sentence in the corpus appears to show the object of one verb serving as the subject of a second verb in a serial verb construction:

(41) *Tany t-ŋat nony pryeta ø-kmke may-ry.*
I 1SG-see s/he night.ghost 3SG-curse dead-LOC
I saw the night ghost curse him to death.

Sentences may be made into questions by the imposition of a questioning (rising) intonation pattern over the sentence, and the high-pitched question particle *é* at the end:

(42) a. *Nony ø-kwe tw.*
s/he 3SG-come PF
He's already arrived.

b. *Nony ø-kwe tw é?*
s/he 3SG-come PF Q
Has he arrived already?

(43) *Kny ykp͡e a-te-ykp͡e é?*
this house 2SG-POSS-house Q
Is this your house?

At the other end of the sentence, a hortative is formed by the particle *y*:

(44) *Y sany s-yem!*
HORT we.DU 1DU-eat
Hey, let's eat!

3.6 SOME SEMANTIC FACTORS IN COMPOUNDS

Whilst an in-depth study of the semantic characteristics of Hatam is beyond the scope of this paper, a few examples of compound nouns can be presented. Note the occasional loss of a final consonant from the first part of a compound.

mother	*mem*	child	*mot(ep)*
sole	*my-dp-mem*	little finger	*d-mot*
	leg-hand-mother		hand-child
intestines	*ŋhop-mem*	child	*mot-ep*
	stomach-mother		child-?
thumb	*d-mem*		
	hand-mother	skin	*gek*
		lip	*hw-gek*
eye	*yay*		mouth-skin
pupil	*yay-gryp*	bark	*pyey-n-gek*
	eye-seed		tree-REL-skin
eyelash	*yay-daty*		
	eye-body.hair	bird	*hap*
		cassowary	*ha-n-t-ŋat*
face	*aysy*		bird-of-I-see
sun	*pyay-aysy*	cockatoo	*ha-yok*
	sun-face		bird-put
face	*yem-aysy*		
	?eat-face		
	(*-yem* 'eat', *tryem* 'ashes')		
?bone	*wak*		
forehead	*ŋ-wak*		
	?-bone		
fingernail	*d-n-wak*		
	hand-REL-bone?		

4. WORDLIST

English	**Hatam**	ashes	tryem
airplane	kapar tbar	axe	oya
all	yhakom	baby	gwo͡ŋmoy
and	kyŋ	back	ŋhym
and then	lene	bad	-kney
ant	ak͡pow	bamboo	kebrym
anus	sow	banana	wyt
arrow	tepor	bat	kom

big	ygy/mdc
bird	hap
cassowary	ha-n-t-ŋat
cockatoo	ha-yok
wing	ha-n-ñhey
black	-mwn (A.), -rom (M.)
blood	grom
board (vehicle)	-pry
body	tap
body hair	daty
boil	phey
bone	jwm
book	srat (<Mal. *surat*)
bow	prey
branch	n-gramty/bram
break	-hat
breast	top
butterfly	tmay
buttocks	woysy
call	-cem
can	-ty
car	oto
cassava	pkayswap
chair	meca
chest	get
chicken	kwry
child	motep/gwom
chin	syphey
chop	-rok
cicada	swem
close	ttey
cloud	pobhwc (A.), mbwc (M.)
coconut	twc
c. tree	twy
c. leaf	tw-n-meŋ
cold	-how (water)
	-tkok (personal)
come	-kwe
corn	trem
crocodile	gor
crow, big	acam
crow, small	(k)(w)syn
cry	-pym
curse	-kmke
cut, kill	-to(t)
day	pyayaysy
dead	may
descent	-cwk
dog	msyen
don't	maw
door	tmow
drink	-twt
dry	-ga
ear	tŋow
earth	tyhey
eat	-yem
egg	kwry tgwey
eye	n-yay
pupil	yay-gryp
eyebrow	yay-grop
eyelash	yay-daty
tear	yay-gwey
excrement	oy
face	yemaysy
fall	-cwt
drop	-pde-cwt
fat	tadc
father	cy/rc (VOC)
far	thyŋ
feather	ha-n-tar
fence	mwkw
fire	hm
fireplace	hm-tok
smoke	hm-mwp
fish	waw
flower	n-tow
fly	kros
blowfly	kros-try
foot, leg	myc
thigh	d-my-hym
calf	my-ŋon
ankle	my-g͡bk
sole	my-dp-mem
toe	my-dp-mom
forest	pyk͡phey
frog	bry
from	lew

fruit	pyey-n-ŋat
gall	keypysy
garden	myay
grass	mdap
ground	tyhey
go	-w
good	-key
green	-mhay
hair	poŋ
hand	dp
arm	dp-aŋa
elbow	d-krosy
finger	dp-swm
fingernail	d-n-wak
left hand	d-prak
little finger	d-mot
palm	d-tyatya
right hand	d-com
thumb	d-mem
wrist	d-toty
have, exist	noka
head	pow
forehead	ŋ-wak
hear	-mwep
heart	ŋona
heavy	phm
hit (w/s.t.)	-pwc
hot~fine	-ŋey (weather)
house	yk͡pe/y
hungry	-gm
husband	cep
I	tany
inside	n-nsy
intestines	ŋhop-mem
kill as a result	Verb + mayry
knee	pyaw
knife	sŋaw
know, can	-kan
lake	mswon
leaf	n-meŋ
lightning	kcey
liver	nsy
little	n-myen
live	-dak
long	n-cey
louse	man
machete	haboy
man	pñay
many	maŋ
meat	ŋ-hwc
midday	jap
moon	pet
morning	japcoty
mosquito	mhyp
mother	t-mem/mey (VOC)
mountain	nŋkw
mouth	hwc
lip	hw-gek
name, be called	ñeŋ
nape	gwpy
neck	kmam
new	-sep
night	mwn
midnight	mwn maw
night ghost	pryeta
nipah palm	cow
nose	hwap
nostril	hwap-msy
no(t)	pc
on	n-typ
one	kom
penis	acwm
person	tŋwo tw
pig	nap
pork	na-n-ŋhwc
place (v.)	-yok
potato	syep
potato, sweet	pkaw
rain	pket
rainbow	pwet
rat	jop
red	-ŋwoy
rib	dypow
rice	pas
road	pwy
roast	-non
roof	caw
root	n-kaw

rope	paw
sago palm	kop
salt	msym
sand	ykm
scar	k͡poka
sea	mknesy
see	-ŋat
seed	n-gryp
short	-cwn
shoulder	ŋhat
sibling	
elder	kdy
younger	kjoy
sick	-gwen
sit	-ykwam
skin	gek
bark	n-gek
sky	kwam
sleep	poŋ
smell (v.)	-kñp
snake	wow
some	poy
spear	mcm
stand	-ksw
star	ham
stomach	ŋhop
sun	pyayaysy
stone	tc
storm (big wind)	korydy
sweat	hagwap
swim	-ha
tail	pw
take, give	-yay
teacher	kwrw
that	kma
this	kny
thorn	gwen
throat	-kpow
thunder	kwkrw
today	amany
tomorrow	jap
tongue	twep
tooth	kway
trunk	n-jem
two	can
under	smw
urine	bon
use	-pap
vagina	mat
valley	nrop
vein	dgalwk
village	kraw
voice, language	syet
wake up	-ksw
want	-coy
want, negative	-kow
wash	-gek-ñey-ty (skin-of water)
water, river	mñey
water, hot	kmey
we (du.)	sany
we (pl.)	ñeny
wet	-tota
white	-thyey
wife	tnem
wind	how
woman	sop
wood	pyey
yellow	-pwk
yesterday	amnany
you sg.	nany
you pl.	ceny

Numbers

one	kom
two	can
three	nŋay
four	k͡ptay
five	mhwe
six	mhw-d kom
seven	mhw-d can
eight	mhw-d nŋay
nine	mhw-d k͡ptay
ten	smnay
eleven	prymy kom
twelve	prymy can
thirteen	prymy nŋay
fourteen	prymy k͡ptay

fifteen	smnay mhy-typ	thirty	ñatoŋwa nŋay
sixteen	prymy kom netey	forty	ñatoŋwa pa ptay
seventeen	prymy can netey	fifty	ñatoŋwa kom pa mhwe
eighteen	prymy nŋay netey	sixty	nŋowa mh-d kom
nineteen	prymy k͡ptay netey	seventy	nŋowa mh-d can
twenty	ñatoŋwa kom	eighty	nŋowa mh-d nŋay
twenty one	ñatoŋwa kom pa kom	ninety	nŋowa mh-d ptay
twenty six	ñatoŋwa kom pa mh-d kom	hundred	nŋo ta smnay

5. WORDLIST 2

In view of the rather abstract phonological analysis proposed in this article, a sample of words is presented in a narrow phonetic transcription so the reader can compare these phonetic transcriptions with the phonemic transcriptions in the longer wordlist. The wordlist is the same as that used in Voorhoeve (1975a).

English	**Hatam**		
arm	ănd̪iˈɸaŋa	louse	ˈmaːnə̆
ashes	ə̆triˈjɛˑmă	man	tɷŋwɔˈduˑwă
bird	ˈhaːβă, haːpˀ	name	aˈɲɛˑŋă
black	mɷwnă, ˈrɔːmə̆	night	ˈmɷwnă
blood	ˈŋgrɔˑmă	one	ǧɔm
bone	ˈndʒuβmă	pig	ˈnaːβă, naːpˀ
come	əˈgwe	see	aˈŋat
dog	mĭsĭˈjɛnă	sit	jɪˈkwam
eat	ĭˈjɛm	skin	ŋgɛkˀ, ˈŋgɛɣă
egg	ˌkɷri ˈdɷ̃ŋgwejă	sleep	aˈbɔŋ
eye	nŭˈjaˑjă	stone	ˈtɪtʃă
fingernail	ˌandə̆nŭˈwaːgă	sun	pɪjaˈjaˑjsija
fire	ˈhɷmă	tail	ˈpɷwă
give	ɨˈjaɨ̯ă	tooth	aˈkwaˑjă
good	kɛ̯j	tree	bŭˈjɛ̯jă
ground	dɪˈhɛ̯jă	two	tʃan
hair	aˈbɔːŋă	water	mŭˈɲɛ̯jă
head	aˈbɔːwă	we (du./pl.)	ˈsaˑni, ˈɲɛˑni
I	ˈdaˑni	you (sg.)	ˈnaˑni
leg	ˈmiːjdʒă	you (pl.)	ˈdʒɛˑni

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BURUM MORPHOPHONEMICS

EILEEN GASAWAY

1. INTRODUCTION

Burum is a Papuan language of the Finisterre-Huon group (McElhanon 1973).[1] Burum-Mindik is spoken by 8,700 people living in the Finschhafen District of the Morobe Province of Papua New Guinea. There are two dialects: Somba (referred in other papers as Burum and Wandahum), spoken in the Burum valley, has two sub-dialects: Wandahum and Yaknge; and Siawari (also referrred to as Kuat and Mindik), spoken in the Mindik area which is the central part of the Kuat valley. This paper will use the Somba dialect as the basis for the analysis with some notes about the Siawari dialect.

This paper is a presentation of the Burum morphophonemic system drawing heavily on various previous papers.[2] The previous papers treated the major processes fairly accurately although the minor rules were generally not discussed. I felt that these rules were important to the understanding of the complete phonological system of Burum. Also the previous discussions were in a prose form and I wanted to present the data and formulate the rules in a more standard generative format. I begin the presentation with a short description of the Burum phonemes and their distribution. This is followed by a description of the morphophonemic system, starting with the more general, cross-language rules and going on to the minor rules that affect relatively few forms. Appendices contain lists of all rules discussed, and of affixes together with other grammatical and phonological information.

2. DESCRIPTION AND DISTRIBUTION OF PHONEMES

The phonemes of Burum are presented in the following chart:

p	t	k	kw	i		u
b	d	g	gw	e	ə	o
	s				a	
	ts					
	dz					
w	r	ɣ				
	l					
	y					
m	n	ŋ				

1 See Olkkonen (1985) for further details of the phonological system.

2 Most of the data for this paper came from various papers written by Soini and Kaija Olkkonen, the SIL team working in the language, and from personal communication with them.

Andrew Pawley, ed. *Papers in Papuan linguistics No.3*, 59-99.
Pacific Linguistics, A-87, 1997.
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A-87:59-99. Pacific Linguistics, The Australian National University, 1997. DOI:*10.15144/PL-A87.59*
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The /ɣ/ phoneme occurs only between vowels, V___V, for example [moɣot] 'one'.[3] The phoneme /w/ has two allophones: [β] which occurs preceding front vowels and [w] which precedes non-front vowels, for example [βem] 'axe', [mewə] 'like that'. Although the voiceless stop phonemes and the alveolar sonorants have several allophones, they are not relevant to this paper.

The spirants /w, r, ɣ/ act together in the morphophonemic processes as counterparts of the bilabial, alveolar, and velar voiceless stops. This is in common with other Finisterre-Huon languages (McElhanon 1973). While in Nabak, a neighbouring related language, these spirants are in allophonic variation with stops, in Burum they are contrastive phonemes initially and between vowels.

[pəndandaŋ]	thunder	[wəlaə]	pencil
[səpa]	fence	[bərəsəwə]	handicraft
[taraŋ]	insect sp.	[rarep]	fence post
[ətək]	hiccough	[arakŋi]	forest
[maluku]	dress	[muɣut]	tree sp.

Stress is predictable in the language, falling always on the first syllable, and is therefore not marked in this paper.

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3 The following abbreviations are used:

<	derives		
→	becomes	Nas	Nasal
#	word boundary	NOM	NOMINALISER
+	morpheme boundary	non pers	nonpersonal
α	either + or – Feature	OBJ	Object
Ø	zero morpheme	ODG	Object Degemination
*	non-occuring form	ONI	Object Nasal Insertion
~	alternates with	pers	personal
ant	anterior	PL	PLURAL
C	Consonant	PN	Pronoun
CD	Consonant Deletion	PNA	Pronoun Nasal Assimilation
cons	consonantal	PRES	PRESENT TENSE
cont	continuant	PST	PAST
cor	coronal	SA	Stop Assimilation
D	Deletion	SF	Surface Form
del rel	delayed release	SG	SINGULAR
DG	Degemination	SING	Singular
DU	DUAL	SmD	Stem /m/ Deletion
DV	Devoicing	son	sonorant
F	Feature	SP	Spirantisation
FNA	Future Nasal Assimilation	sp	species
FUT	FUTURE TENSE	SpC	Spirantisation-Compound
GF	Glide Formation	syll	syllabic
HAB	HABITUAL ASPECT	TOP	Topic morpheme
HmD	Habitual /m/ Deletion	TP	Topic Rule
I	Insertion	UF	Underlying Form
indef	indefinite	V	Vowel
interr	interrogative	VC	Voicing
ISD	Identical Sequence Drop	Vd	voiced
Lat	Lateral	VH	Vowel Harmony
Loc	Locative	Vl	voiceless
MS	Manuscript	VNI	Verbal Nasal Insertion
N-S	Nasal-Stop	y-E	y-Epenthesis

Many of the morphological operations result in consonants adjoining across morpheme boundaries. The following generalisations can be made about phonetic consonant clusters in Burum:

1. There is a general prohibition against geminates.
2. Voiceless stops /p, t, k/, nasals, and /l/ are the only consonants allowed in syllable final position either followed by a consonant or word finally.
3. All the above phonemes can be followed by nasals.

[kwetni]	my name
[kekmak]	kind of arrow
[βemni]	my axe
[əlŋap]	true

4. All syllable-final consonants can be followed by stops and affricates that agree in voicing.

[nengi]	your sister
[seŋgwe]	kunai-grass
[kwəlbə]	ficus tree
[esapkəm]	temptation

5. Except for the allowable sequences of voiceless stop followed by nasal, consonant clusters which do not agree in voicing occur only in reduplicated forms and compounds.

[welenkwekwe]	messenger (*welen* 'message' + *kwekwe* 'shaking')
[kinkin]	standing

6. The continuants /r, w, y, ɣ/ are never part of consonant sequences, in either position.

3. MAJOR RULES AND PROCESSES

There are four major processes that affect all types of words in simple forms and in compound and reduplicated forms. These are: degemination, spirantisation, voicing and y-epenthesis. These processes are language-wide.

3.1 DEGEMINATION

A general process of degemination is quite widespread throughout the Burum language.

Consider the noun forms in (1)-(2):

	____#	his____	my____	
(1)a.	*sep*	*sepŋi*	*sepni*	blood
b.	*nup*	*nupŋi*	*nupni*	garden
(2)a.	*nen*	*nenŋi*	*neni*	sister
b.	*sin*	*sinŋi*	*sini*	leaf

We can see that the root for 'blood' is /sep/ in all forms while 'garden' is /nup/, /nen/ is 'sister', and /sin/ is 'leaf'. In the second column /-ŋi/ is 'his'. In the third column in (1a)-

(1b), 'my' is clearly /-ni/ but in (2a)-(2b) in the third column where we would expect /nenni/ and /sinni/, we see deletion of the /n/ when it occurs next to another /n/.

Now consider the forms in (3)-(5):

	____#	about___	with___	a little___	
(3)a.	*sep*	*sepkə*	*sepuk*	*septəp*	blood
b.	*nup*	*nupkə*	*nupuk*	*nuptəp*	garden
(4)a.	*kwet*	*kwetkə*	*kwetpuk*	*kwetəp*	name
b.	*kosoɣot*	*kosoɣotkə*	*kosoɣotpuk*	*kosoɣotəp*	story
(5)a.	*kelək*	*keləkə*	*keləkpuk*	*keləktəp*	grease
b.	*kaβik*	*kaβikə*	*kaβikpuk*	*kaβiktəp*	hook

The unaffixed form in the first column shows the root morpheme that can be isolated in each form across the row. Notice the roots end in voiceless consonants /p, t, k/. Now looking down each column, the suffixes can be isolated as well: /-kə/ 'about' in the second column, /-puk/ 'with' in the third column and /-təp/ in the fourth column, all beginning with voiceless stops. Notice that in forms where we would expect a geminate cluster, only one consonant occurs, for example [sepuk] from /sep+puk/ 'with blood'; [kwetəp] from /kwet+təp/ 'a little name'. Thus there is a deletion when two identical consonants come together.

Degemination also occurs in verbs. Consider the forms in (6)-(7):

	PST.2SG	PST.2/3PL	PRES.3SG	
(6)a.	*etnəŋ*	*etket*	*etsa*	come down
b.	*kotnəŋ*	*kotket*	*kotsa*	go up
(7)a.	*eknəŋ*	*eket*	*ektsa*	see
b.	*aknəŋ*	*aket*	*aktsa*	do

Here the verb stems can be isolated in the first column as /et/ 'come down', /kot/ 'go up', /ek/ 'see' and /ak/ 'do'. The present tense is /-ts/. The Subject person-number markers are /-nəŋ/ '2 Singular', /-ket/ '2/3 Plural' and /-a/ '3 Singular'. The past tense marker is Ø. In the second column in (7a)-(7b) we would expect /ekket/ [eket] and /akket/ [aket] and in the third column in (6a)-(6b) we would expect /ettsa/ [etsa] and /kottsa/ [kotsa]. Again there is degemination.

A rule accounting for the above observations can be formulated as follows:

Degemination (DG)

$$C_{[\alpha F]} \rightarrow \emptyset \; / \; C_{[\alpha F]} \_\_\_\_$$

This rule states that a consonant is deleted when it occurs following another identical consonant.

Degemination also applies to reduplicated forms as shown in (8c)-(8e), as compared to (8a)-(8b) where no degemination occurs:

(8)a.	*tokotoko*	meeting	cf. *toko*	to meet
b.	*malmal*	life	cf. *mal*	to live
c.	*korakorak*	ear pain	cf. *korak*	ear wax

d.	*mutsumutsum*	tree type	cf. *mutsum*	tree type
e.	*tatat*	sitting	cf. *tat*	to sit

3.2 SPIRANTISATION

Taking the same noun root morphemes which were presented in examples (3)-(5), consider the forms in (9)-(11):

	my___	only____	really____	
(9)a.	*sepni*	*sewək*	*sewap*	blood
b.	*nupni*	*nuwək*	*nuwap*	garden
(10)a.	*kwetni*	*kwerək*	*kwerap*	name
b.	*kosoɣotni*	*kosoɣorək*	*kosoɣorap*	story
(11)a.	*keləkni*	*keləɣək*	*keləɣap*	grease
b.	*kaβikni*	*kaβiɣək*	*kaβiɣap*	hook

The suffixes may be isolated as /-ni/ 'my', /-ək/ 'only' and /-ap/ 'really'. In (9a)-(9b) we see the stem final stop /p/ in the first column alternates with the spirant /w/ in the second and third columns. Similarly in (10a)-(10b) we see the stop /t/ alternating with the spirant /r/. While in (11a)-(11b) the stop /k/ alternates with the spirant /ɣ/. The environment of this alternation of stop versus spirant is that the spirant occurs preceding a vowel. These three spirants /w, r, ɣ/ form a natural class together which I will call 'spirants' following McElhanon's (1979) description of Nabak, a neighbouring related language. Looking at the forms in (3)-(5) and (9)-(11), the base forms of roots could end in either a stop or a spirant because spirants and voiceless stops never contrast in stem final position in Burum. I choose to derive the more marked spirant from the less marked voiceless stop, that is the underlying forms are /sep/ 'blood', /nup/ 'garden', /kwet/ 'name', /kosoɣot/ 'story', /kelək/ 'grease', and /kaβik/ 'hook'. A rule can be formulated as follows:

Spirantisation (SP)

$$\begin{bmatrix} \text{C} \\ \text{-sonorant} \\ \text{-voice} \end{bmatrix} \rightarrow \begin{bmatrix} \text{+cont} \\ \text{+voice} \end{bmatrix} \quad / \quad \text{V}\_\_\text{+V}$$

This rule states that a voiceless stop consonant becomes a voiced spirant when it occurs between vowels across a morpheme boundary.

Consider now some forms that seem to violate this Spirantisation rule from (3)-(4), repeated here as (12)-(13):

(12)a.	*sepuk*	with blood
b.	*nupuk*	with a garden
(13)a.	*kwetəp*	a little name
b.	*kosoɣotəp*	a little story

Here we seem to have the voiceless stops where the continuant should be according to the Spirantisation rule. However, note that the underlying structure of these forms is a geminate cluster. Degemination evidently applies after Spirantisation thus bleeding the spirantisation of voiceless stops from geminate clusters. This is true of polymorphemic forms.

In monomorphemic forms the spirants are more frequent than stops between vowels. There is a surface contrast then between voiceless stops and spirants between vowels (see §2). I could assume that any example of voiceless stop between vowels is underlyingly a geminate cluster even though it may not be transparent, that is [səpa] from /səppa/ 'fence' and [maluku] from /malukku/ 'dress'. One reason for this assumption is that there is no morpheme which ends in a voiceless stop which does not undergo spirantisation preceding a vowel. Even though the Spirantisation rule refers to a morpheme boundary because of other forms, it does not detract from the fact that it also applies to mono-morphemic forms. This leads to a more systematic understanding of the Burum phonological system. However, I will not make this assumption a part of the phonological system at this time.

One of the implications of the geminate stop reduction analysis is that it might be possible to remove the voiced spirants from the phonemic inventory. This would result in an inventory that is more similar to other related languages (McElhanon 1979). This proposal works well for the velar consonants as /ɣ/ only occurs between vowels. However the bilabial and alveolar continuants do not have this restriction, that is they occur initially: /wai/ 'thorn, prickle', /wem/ '(stone) axe', /roro/ 'grass (sp)', /rai/ 'storm'.

Sample derivation:

UF	#sep+ək#	#sep+ni#	#kwet+ək#	#sep+puk#	#səppa#
SP	sew+ək	------	kwer+ək	------	------
DG	--------	------	------	sep+uk	səpa
SF	[sewək]	[sepni]	[kwerək]	[sepuk]	[səpa]
	only blood	my blood	only a name	with blood	fence

Verbs also show the affects of Spirantisation. Consider the forms in (14)-(15):

	PST.2SG	PST.1SG	PST.1PL	
(14)a.	*etnəŋ*	*eral*	*erin*	come down
b.	*kotnəŋ*	*koral*	*korin*	go up
(15)a.	*eknəŋ*	*eɣal*	*eɣin*	see
b.	*aknəŋ*	*aɣal*	*aɣn*	do

The past tense marker is Ø. The '2SG' is /-nəŋ/, the '1SG' marker is /-al/ and '1PL' is /-in/. The verb stems already established in (6)-(7) now show the same alternation of stop and continuant as shown in the nouns in (9)-(11). So the Spirantisation Rule applies to verbs as well.

Sample derivation:

UF	#ek+Ø+al#	#kot+Ø+al#	#ak+ts+al#	#et+ts+al#
SP	eɣ+al	kor+al	------	------
DG	------	------	------	et+s+al
SF	[eɣal]	[koral]	[aktsal]	[etsal]
	I saw	I went up	I go down	I come

This rule does not usually apply to reduplicated forms, as shown in (16)-(17), and (19) or to compound words, as shown in (18):

(16)	*əsupəsup*	full of warmth	not **əsuwəsup*	cf. /əsup/	warm
(17)	*imutimut*	dream	not **imurimut*	cf. /imut/	picture

(18)	*imutoɣoɣo*	drawing	not **imuroɣoɣo*	cf. /oɣoɣo/	drawing
(19)	*kaka*	the coming	not **kaɣa*	cf. /ka/	to come

However, look at the forms in (20)-(22):

(20)	*eret*	the going down	cf. /et/	go down
(21)	*aɣak*	the doing	cf. /ak/	do
(22)	*awanəm*	spouses	cf. /ap/	husband + /anəm/ wife

A possible difference between (16)-(19) and (20)-(22) is that the latter have identical vowels and the consonant is morpheme final. Consequently I propose to formulate a corollary Spirantisation rule to account for this:

Spirantisation-Compound (SpC)

$$\begin{bmatrix} C \\ -\text{sonorant} \\ -\text{voice} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{cont} \\ +\text{voice} \end{bmatrix} \quad / \quad V \underset{[\alpha F]}{\quad\quad} \#V_{[\alpha F]}$$

This rule states that a voiceless stop consonant becomes a voiced spirant if it occurs between two like vowels across a word boundary and the consonant is word final.

The fact that such a rule applies to the process of reduplication as well as compounding shows that Reduplication is a word building process. This rule is morphologically restricted in that it applies to compounds and reduplications that are derivational. The Spirantisation and Degemination rules apply to other derivational processes, for example /amət/ 'cold' + /i/ 'verbaliser' > /aməri/ 'get cold'. This can be demonstrated by a continuum showing three points with what rules do and do not apply at each level.

2 separate words	Compound/Reduplication		Inflection/Derivation	
-SP -DG	-SP +SpC	+DG	+SP	+DG

Sample derivation:

UF	#imut#RED#	#et#RED#	#ap#anəm#
RED	imut#imut	et#et	------
SpC	------	er#et	aw#anəm
SF	[imutimut]	[eret]	[awanəm]
	dream	the going down	spouses

3.3 VOICING

Another fairly widespread alternation is in stop voicing. Compare the nouns in (23) (repeated from (3a) and (4a)) with those in (24):

	with___	about___	a little___	
(23)a.	*kwetpuk*	*kwetkə*	*kwetəp*	name
b.	*sepuk*	*sepkə*	*septəp*	blood

(24)a.	*sinbuk*	*singə*	*sindəp*	leaf
b.	*dzəlbuk*	*dzəlgə*	*dzəldəp*	throat

The noun roots in (23)-(24a) have been seen above: /sep/ 'blood' and /sin/ 'leaf' and /kwet/ 'name' in (3a). In (24b) the noun root morpheme can be isolated as /dzəl/ 'throat'. Notice that the suffixes show alternations /-puk~-buk/ 'with', /-kə~-gə/ 'about' and /-təp~-dəp/ 'a little'. The initial stop of the suffixes is either voiced or voiceless. The voiceless consonant follows a stem final voiceless stop and voiced consonant a stem final voiced consonant. The choice of the base form is at this point arbitrary.

To help determine the base form, consider the further forms in (25):

	with___	about___	a little___	
(25)a.	*alabuk*	*alagə*	*alatəp*	friend
b.	*baubuk*	*baugə*	*bautəp*	pig

Here the noun roots can be isolated as /ala/ 'friend' and /bau/ 'pig'. After a vowel final root, the initial bilabial or velar consonant of the suffix is voiced and the alveolar consonant is voiceless. Since there is no consonant in the environment to predict the form of the suffix, I assume the underlying forms are /-buk/ 'with', /-gə/ 'about' and /-təp/ 'a little'.

Similarly in verbs in (26)-(27):

	PST.2/3PL	PRES.3SG	FUT.1PL	
(26)a.	*etket*	*etsa*	*etpin*	come down
b.	*kotket*	*kotsa*	*kotpin*	go up
(27)a.	*anget*	*andza*	*anbin*	go
b.	*malget*	*maldza*	*malbin*	be
(28)a.	*kaget*	*katsa*	*kabin*	come
b.	*dziget*	*dzitsa*	*dzibin*	say

Example (26a)-(26b) (repeated from (6)) shows the verb stems as /et/ 'come down' and /kot/ 'go up' which end in voiceless stops. In (27a)-(27b) the verb stems can be isolated as /an/ 'go' and /mal/ 'be' ending in voiced consonants. Examples (28a)-(28b) then show stems that end in vowels: /ka/ 'come' and /dzi/ 'say'. The suffixes show the same alternation of voiced and voiceless stops as seen above in the nouns. Since the voicing is unpredictable following a vowel, the base forms for the suffixes will be the forms that appear following a vowel: /-get/ '2/3PL', /-ts/ 'present tense' and /-b/ 'future tense'.[4]

A rule accounting for the above observations can be formulated as follows:

---

[4] It is interesting to note that the bilabial and velar stops are voiced following a vowel while the alveolar obstruents are voiceless in the same environment.

/alabuk/	with a friend	/kabin/	we will come
/alagə/	about a friend	/kaget/	they come
/alatəp/	a little friend	/katsa/	he comes

Thus voicing is somewhat predictable across morpheme boundaries but is still contrastive within morphemes, e.g.

/gipi/	ginger	/gəbun/	tree sp.
/butun/	insect sp.	/kude/	not
/baka/	bring	/baga/	cane type

Voicing Rule (VC)

C	→	[α voice]	/	C	___
[-sonorant]				[α voice]	

This rule states that a stop consonant agrees in voicing when it occurs following another consonant.
Condition: The rule does not apply where the form is reduplicated or a compound, that is /kinkin/ 'the standing' cf. /kin/ 'to stand', /təmuntəmun/ 'snail' cf. /təmun/ 'shell'.

This rule then explains the devoicing that occurs when an suffix beginning with a voiced stop occurs after a stem that ends with a voiceless consonant and similarly the voicing that occurs when an suffix beginning with a voiceless stop occurs after a stem that ends with a voiced consonant.

Sample derivations:

UF	#ka+Ø+get#	#et+Ø+get#	#an+Ø+get#	#an+ts+a#	#ka+b+in#
VC	-----	et+ket	-----	an+dz+a	-----
SF	[kaget]	[etket]	[anget]	[andza]	[kabin]
	they came	they came down	they went	he goes	we will come

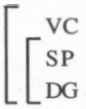
Voicing must be ordered before Degemination as the opposite order would result in unacceptable forms. Voicing feeds Degemination, that is provides forms that meet the environment of Degemination.

UF	#ek+Ø+get#		#ek+Ø+get#	
DG	-----	VC	ek+ket	
VC	ek+ket	DG	ek+et	
	*[ekket]	SF	[eket]	they saw

As seen in the previous section, Spirantisation must be ordered before Degemination as Degemination results in forms that meet the environment of Spirantisation, to which Spirantisation does not apply.

UF	#sep+buk#		#sep+buk#	
VC	sep+puk	VC	sep+puk	
DG	sep+uk	SP	------	
SP	sew+uk	DG	sep+uk	
	*[sewuk]	SF	[sepuk]	with blood

Therefore Spirantisation must be ordered before Degemination and Voicing must be ordered before Degemination but there is no crucial ordering between Voicing and Spirantisation.



Spirantisation affects the final segment while Voicing affects the initial segment.[5] McElhanon (1973:6) states for the rest of the Western Huon Family, "The rule generally is that when a morpheme which ends with a final voiceless unreleased stop or begins with an initial voiced stop co-occurs contiguous to a vowel, the voiced or voiceless stop is replaced by a flat spirant (or lateral) phoneme at the corresponding point of articulation."

3.4 Y-EPENTHESIS

Consider the verb forms in (29):

	PST.2/3PL	PST.1PL	PST.1SG	PST.2/3DU	
(29)a.	*anget*	*anin*	*anal*	*anoɣot*	go
b.	*malget*	*malin*	*malal*	*maloɣot*	be

To establish the verbal suffixes, I use the verb stems previously discussed in (27), which can be isolated as /an/ 'go' and /mal/ 'be'. This leaves /-get/ '2/3PL', /-al/ '1SG', /-in/ '1PL', and /-oɣot/ '2/3DU'. As previously shown, 'past' is Ø.

Consider the verbs in (30)-(35):

	PST.2/3PL	PST.1PL	PST.1SG	PST.2/3DU	
(30)a.	*meget*	*mein*	*meyal*	*meyoɣot*	take
b.	*neget*	*nein*	*neyal*	*neyoɣot*	eat
(31)a.	*dziget*	*dziin*	*dziyal*	*dziyoɣot*	say
b.	*osiget*	*osiin*	*osiyal*[6]	*osiyoʊot*	be unable
(32)a.	*kaget*	*kain*	*kayal*	*kayoɣot*	come
b.	*bakaget*	*bakain*	*bakayal*	*bakayoɣot*	bring
(33)a.	*oɣoget*	*oɣoin*	*oɣoyal*	*oɣoyoɣot*	cook
b.	*tokoget*	*tokoin*	*tokoyal*	*tokoyoɣot*	meet
(34)a.	*turuget*	*turuin*	*turuyal*	*turuyoɣot*	cover
b.	*utuget*	*utuin*	*utuyal*	*utuyoɣot*	chop
(35)a.	*gəɣəget*	*gəɣəin*	*gəɣəyal*	*gəɣəyoɣot*	bite
b.	*ərəget*	*ərəin*	*ərəyal*	*ərəyoɣot*	pull

In the first two columns, all roots end in vowels: /e/ in (30) (/me/ 'take', /ne/ 'eat'); /i/ in (31) (/dzi/ 'say', /osi/ 'be unable'); /a/ in (32) (/ka/ 'come', /baka/ 'bring'); /o/ in (33) (/oɣo/ 'cook', /toko/ 'meet'); /u/ in (34) (/turu/ 'cover', /utu/ 'chop'); /ə/ in (35) (/gəɣə/ 'bite', /ərə/

---

5 In some language areas, in one word with the morpheme /-təp/, the initial stop spirantises although it is morpheme initial not final as the SP rule specifies: /morərəp/ 'childhood' < /morə/ 'child' + /təp/ 'a little'. It is possible that this form acts more like a compound than an affixed word and fits more closely the environment of the Spirantisation-Compound rule of like vowels.

6 In examples (30)-(31) in the third column the actual phonetic forms of this verbs are [meal] 'I took', [neal] 'I ate', [dzial] 'I said' and [osial] 'I was unable'. There is no phonetic contrast and a neutralisation between [ea] and [eye] as well as [ia] and [iya] so it is arbitrary which phonetic form is used. The form with the /y/ offers more consistency with the other verb forms. There is a low level phonetic rule which deletes the /y/ in these forms.

'pull'). In the third and fourth columns of (30)-(35) however, all verbal forms contain a /y/. The /y/ also occurs in nouns:

/oye/	in the water < /o/ 'water' + /e/ 'locative'
/alayək/	only a friend < /ala/ 'friend' + /ək/ 'only'
/leiyək/	from Lae < /lei/ 'Lae' + /ək/ 'from'

There are three possible sources for the /y/ in these cases: 1) the /y/ is part of the root, 2) the /y/ is part of the suffix or 3) the /y/ is epenthetic. If we assume these roots end in /y/, then no root ends in a vowel and the /y/ must be deleted before a consonant initial suffix. If we assume the affixes begin with /y/, it must be deleted after a consonant final root. If it is epenthetic, it acts to break up vowel sequences. The epenthetic nature of the /y/ seems most satisfactory. Since it would explain why /y/ does not occur before /i/ in the first person dual and plural forms.

A rule can be formulated that will insert a /y/ in a principled way in these vowel sequences.

y-Epenthesis (y-E)

$$\emptyset \rightarrow \begin{bmatrix} \text{-syll} \\ \text{-cons} \\ \text{+high} \\ \text{-back} \end{bmatrix} \; / \; \begin{matrix} \text{V} \\ \text{[-High]} \end{matrix} \; + \; \underline{\quad} \; \text{V}$$

This rule states that a /y/ is inserted between two vowels across a morpheme boundary if the second vowel is not high.

This rule affects both acceptable sequences, for example /uo/ and unacceptable ones, for example */aa/. The following examples also show why the morpheme break is needed in the rule. Examples of acceptable sequences without /y/:

/koŋaeŋ/	bird type
/aip/	nest
/madzuaŋ/	taipan
/tuatŋi/	white

Compare the last two examples with /turuyal/ 'I covered' (34a) in which the same sequence /ua/ occurs both with and without /y/.

3.5 SUMMARY

I summarise here what has been described of Burum phonological structure so far. Nouns, verbs and other word classes occur with various suffixes. When affixation occurs, several predictable, widespread changes take place. For example, when a root which ends in a voiceless stop occurs preceding a suffix beginning with a vowel, spirantisation of the stop takes places. The significant facts that need to be known are the features of the final segment of the root and the features of the initial segment of the suffix. Roots can end with the following classes of sounds: 1) Voiceless stops,[7] 2) Nasals and the lateral, and 3) Vowels. Suffixes have the following classes as the initial segment: 1) Voiced stops /b, g/, 2) Voiceless

7 Verbs roots cannot end in /p/.

stop /t/, 3) Nasals and the lateral, 4) Vowels [-High] and 5) Vowels [+High]. The vowels need to be divided in the affixes as the [+High] vowels provoke different changes from the other vowels. Degemination deletes one of the sequences of consonants and y-Epenthesis adds a segment to separate sequences of vowels.

I now present in chart form the different possibilities when stems and affixes come together.

	Initial segment				
	Vd stop	Vl stop	Nas/Lat	V[-High]	V[+High]
Final seg.					
Vl stop[8]	VC(DG)[9]	Ø(DG)	Ø	SP	SP
Nasal/Lat	Ø	VC	Ø(DG)	Ø	Ø
Vowels	Ø	Ø	Ø	y-E	Ø

In the following sections I discuss rules that are confined in scope to a few forms or subset of words, but the major processes still affect these forms as well.

4. PRONOUN PROCESSES

The following are a set of rules that deal exclusively with pronouns.

4.1 NASAL ASSIMILATION

Consider the pronoun and noun forms in (36):

	Topic	only___	with____	of_____	
(36)a.	*tosatŋan*	*tosatŋanək*	*tosatŋambuk*	*tosatŋaŋgə*	some
b.	*toninan*	*toninanək*	*toninambuk*	*toninaŋgə*	leader

The two roots can be separated first: /tosat/ 'some' and /to/ 'leader'. The final morphemes in the second, third and fourth columns are clitics: /-ək/ 'only' (see also (9)-(11)), /-buk/ 'with' and /-gə/ 'of' (see also (23)-(24)). The morpheme next to the root shows the possession: /-ŋ/ '3SG possessive' (which occurs with all types of pronouns) and /-nin/ '1PL possessive' as in /alanini/ 'our friend' and /alaŋi/ 'his friend'. The final /i/ is absent when other suffixes occur. The '3SG possessive' marker /-ŋ/ often occurs with adjectives and indefinite pronouns and loses some of the the meaning of 'possession'. The remaining morpheme 'topic' shows the alternation /-an~-am~-aŋ/. This is the form of the Topic clitic which occurs with indefinite pronouns and possessed nouns (see 6.10 for Topic rule). The final nasal assimilates to the point of articulation of the following stop. The alveolar nasal /n/ occurs preceding silence or a vowel in the first and second columns so I take /-an/ to be the base form.

Thus the forms in (36) can be diagrammed or parsed as

a.	*tosat+ŋ+an*	*tosat+ŋ+an+ək*	*tosat+ŋ+am+buk*	*tosat+ŋ+aŋ+gə*
	some+3S+TOP	some+3S+TOP+only	some+3S+TOP+with	some+3S+TOP+of

---

8 I have combined the voiceless stops realising that /p/ does not occur stem finally in verbs.

9 As a result of the Voicing rule, there may be identical consonants that will then undergo Degemination.

b.	*to+nin+an*	*to+nin+an+ək*	*to+nin+am+buk*	*to+nin+aŋ+gə*
	leader+1PL+TOP	ldr+1PL+TOP+only	ldr+1PL+TOP+with	ldr+1PL+TOP+of

Consider the forms in (37):

	with____	of____	
(37)a.	*dabuk*	*dagə*	who
b.	*nəmbuk*	*nəŋgə*	1SG
c.	*nembuk*	*neŋgə*	1PL
d.	*yembuk*	*yeŋgə*	2/3PL

The forms in (37) show the same kind of alternation in another morpheme as in (36). The first and second columns show /-buk/ 'with' and /-gə/ 'of' as the final morphemes. The stems can be separated as /da/ 'who', /n/ '1 person' and /y/ '2/3 person'. The number of the pronoun can be distinguished by the vowel in the forms of the Nominaliser clitic which occurs with personal pronouns, /ə/ 'singular' and /e/ 'plural'. The Nominaliser clitic also shows the same nasal alternation as shown in (36): /-əm~-əŋ/ and /-em~-eŋ/. The final nasal assimilates to the point of articulation of the following stop. There are no forms in Burum with these two allomorphs of this morpheme preceding a vowel. As the alveolar nasal does not occur, I take as the base form the /VN/ form for this clitic. It would be possible in some theoretical frameworks to posit an abstract underlying form of /Vn/ for the Nominaliser clitic. The advantage would be that it would show the similarity to the Topic clitic more clearly. However, I have decided on principle not to posit abstract forms in this paper.

The following rule can be formulated to account for the above observations:

Pronoun Nasal Assimilation (PNA)

C	→	[α point]	/	____	+	C
[+nasal]						[α point]
[Topic/NOM Clitic]						

This rule states that a nasal in the Nominaliser/Topic clitic becomes the same point of articulation as the stop it precedes across a morpheme boundary.

The reference to the Nominaliser clitic in the rule is there because there are forms that allow /ŋb/ as a sequence: /deŋ+bin/ 'we will scatter', also /ŋd/ /diŋ+diŋi/ 'upright, straight', /ng/ /nen+gi/ 'your sister'. All of these clusters are across morpheme boundaries.

Sample derivations:

UF	#to+ŋ+an+gə#	#tosat+ŋ+an+ək#	#n+eŋ+buk#
PNA	to+ŋ+aŋ+gə	-----	n+em+buk
SF	[toŋaŋgə]	[tosatŋanək]	[nembuk]
	of its leader	only some	with us

4.2 VOICED STOP SPIRANTISATION

There is a corollary process to the Spirantisation rule as discussed in §2.2. Consider the forms in (38) (repeating (37b), (37d) forms as (38a), (38b)):

	Topic	with___	of___	
(38)a.	*nəŋən*	*nəmbuk*	*nəŋge*	1SG
b.	*yeŋən*	*yembuk*	*yeŋgə*	2/3PL
c.	*gəŋən*	*gəbuk*	*gəɣə*	2SG

The new forms in (38c) can be isolated as follows: /g/ '2SG root' and /ə/ '2SG Nominaliser'. The change can be seen in the third column with the alternation of the Possessive clitic as /-gə~-ɣə/. The 2SG form of the Nominaliser clitic is the only form that does not have a final consonant so the initial voiced stop of the Possessive clitic is between vowels, the same environment that triggers SP for voiceless stops. Observe that this alternation occurs between like vowels as does Spirantisation-Compound rule. Notice also that this process only occurs with the velar stop in [gəɣə], not the bilabial one in [gəbuk].

The following rule can be formulated to account for the above observations:

Spirantisation-1 (SP-1)

$$\begin{bmatrix} \text{-cont} \\ \text{-cor} \\ \text{-ant} \\ \text{+voice} \end{bmatrix} \rightarrow [\text{+cont}] \quad / \quad \underset{[\alpha F]}{V} \; + \; \underset{[\alpha F]}{\_\_V} \; [\text{2nd singular}]$$

This rule states that the velar voiced stop becomes the velar spirant when it occurs between like vowels and across a morpheme boundary.
Condition: This rule only applies to 2SG.

Note: The condition of [2SG] is added because there are other forms that meet the phonological environment but Spirantisation-1 or Spirantisation-Compound rule does not apply, for example /meget/ 'you (pl)/they took'.

Sample derivations:

UF	#n+əŋ+gə#	#g+ə+gə#	#g+ə+buk#
SP-1	-----	g+ə+ɣə	-----
SF	[nəŋgə]	[gəɣə]	[gəbuk]
	of mine	of yours	with yours

5. OBJECT PREFIXING VERBS

There is a small finite set of verbs that require a prefix showing the object of the verb. When the object marker is affixed to the verb stem, several morphophonemic changes take place.

The following are two complete paradigms of object prefixing verbs. I will keep the subject person-number and tense constant throughout: 3SG present.

	burns	shoots	
(39)a.	*noɣotsa*	*neritsa*	he___me
b.	*goɣotsa*	*geritsa*	he___you
c.	*oɣotsa*	*eritsa*	he___him
d.	*nekoɣotsa*	*nekeritsa*	he___us two
e	*ekoɣotsa*	*ekeritsa*	he___you/them two
f.	*neŋgoɣotsa*	*neŋgeritsa*	he___us
g.	*eŋgoɣotsa*	*eŋgeritsa*	he___you/them

Comparing the columns with each other, we can see a similarity of forms in what is analysed as the object prefix. The morpheme complex /tsa/ is '3SG present', and the verb stems can be shown most clearly with the '3SG object' which has been analysed as Ø, /oɣo/ 'burn' and /eri/ 'shoot'. The following chart summarises the person-number of the object prefix:

	SG	DU	PL
1	*n-*	*nek-*	*neŋg-*
2	*g-*	*ek-*	*eŋg-*
3	Ø		

5.1 ə-INSERTION

The examples in (39) showed verb stems that began with a vowel. Consider now the following verbal forms in (40):

	3SG.OBJ	1SG.OBJ	2SG.OBJ	2/3PL.OBJ	
(40)a.	*eriyək*	*neriyək*	*geriyə*	*eŋgeriyək*	he shot___
b.	*mosotək*	*nəmosotək*	*gəmosotək*	*eŋgəmosotək*	he left___
c.	*məriyək*	*nəməriyək*	*gəməriyək*	*eŋgəməriyək*	he anointed___

The forms in (40a) have been repeated from (39a)-(39c), (39g) except that past tense is used. The morpheme /yək-~ək-/ is '3SG past'. The 3SG object prefixes show the verb stems most clearly because it is Ø, /eri/ 'shoot', /mosot/ 'leave' and /məri/ 'anoint'. In the second, third and fourth columns, the object prefixes show the following alternations: /n-~nə-/ '1SG', /g-~gə-/ '2SG' and /eŋg-~eŋgə-/ '2/3PL'. The /ə/ is either inserted before a consonant or deleted before a vowel. I would like to take the option of insertion because /ə/ as a central weak vowel is often inserted in other languages and there is no evidence to prove that it is deleted in Burum. So I take as the base form the alternation without /ə/ and insert it by rule.

ə-Insertion (ə-I)

$$\emptyset \rightarrow /ə/ \;/\; \begin{matrix} \#\,C\_\_\_\_ + C \\ C \\ [\text{OBJ Prefix}] \end{matrix}$$

This rule states that a /ə/ is inserted between two consonants when the first consonant is word initial or follows another consonant in the object prefix.

The specification of object prefix in this rule is needed as some of the consonants involved, for example [nm], are acceptable consonant clusters in other word types, for example /nenmungi/ 'your siblings'.

	Sample derivation:	
UF	#n+oɣol+Ø+ək#	#n+mosot+Ø+ək#
ə-I	-----	nə+mosot+ək
SF	[noɣolək]	[nəmosotək]
	he called me	he left me

5.2 SPIRANTISATION REVISITED

In §3.2 I formulated a rule (Spirantisation-1) in which a voiced stop, /g/, becomes a continuant between vowels in 2SG.

Spirantisation-1 (SP-1)

$$\begin{bmatrix} -\text{cont} \\ -\text{ant} \\ -\text{cor} \\ +\text{voice} \end{bmatrix} \rightarrow [+\text{cont}] \quad / \quad \begin{matrix} V + \_\_\_V \\ [\alpha F] \quad [\alpha F] \\ [2SG] \end{matrix}$$

This rule states that the velar voiced stop becomes the velar spirant when it occurs between vowels and across a morpheme boundary.
Condition: This rule only applies to 2SG.

This same process applies to two verbs in the object prefixing set of verbs. Consider the forms in (41):

	1SG.OBJ	2SG.OBJ	
(41)a.	*nuŋguma*	*guvɣma*	he will hit___
b.	*niŋgima*	*giɣma*	he will give to___

Disregarding the vowel quality and the velar nasal for the moment, the '1SG object' is /nuŋ-~niŋ-/ and '2SG object' is /gu-~gi-/. The future tense is /-m/ and /-a/ is '3SG subject'. The verb stems can be seen in the first column as /gu/ 'hit' and /gi/ 'give to' with the second column showing the alternates /ɣu/ and /ɣi/ respectively. Here the voiced velar stop has become a spirant in the same environment as the pronoun forms. The Spirantisation-1 applies as it is still 2SG. (See the end of this section for full derivations.)

5.3 VOWEL HARMONY

Let us deal with the other alternation of the vowels exhibited by the object prefixes in (41), disregarding the velar nasal (see next section).

Here the verb stems are /gu~ɣu/ 'hit' and /gi~ɣi/ 'give to'. The base form is the stop form with spirantisation accounted for by Spirantisation-1 (See §4.2). The stop form is the base form. Now the object person markers show the following alternation: /nuŋ-~niŋ-/ '1SG object' and /gu-~gi-/ '2SG object'. The vowel in the object marker harmonises with the first stem vowel in these two verbs. These are the only two verbs in this set of verbs that have high vowels as the first vowel. From the discussion above in §4.1 (ə-Insertion), the derived form for the object prefix is /Cə/ before consonants. So a rule can be formulated as follows:

Vowel Harmony (VH)

$$\begin{matrix} /ə/ \\ [\text{OBJ Prefix}] \end{matrix} \rightarrow \begin{bmatrix} +\text{High} \\ \alpha\text{Back} \end{bmatrix} \quad / \quad \_\_\_\_\_(C) + C \quad V \begin{bmatrix} +\text{High} \\ \alpha\text{Back} \end{bmatrix}$$

This rule states that a /ə/ that is in the object prefix becomes High and agrees in Backness with a following high vowel. There may be one to two intervening consonants and there must be at least one or two, across the morpheme boundary, as the vowel /ə/ only occurs before consonants.

Vowel Harmony must be ordered after ə-I so that the /ə/ will be present for Vowel Harmony to apply.

$$\begin{bmatrix} ə\text{I} \\ \text{VH} \end{bmatrix}$$

5.4 OBJECT NASAL INSERTION

Another process in the object prefixing set of verbs is nasal insertion. Consider the forms in (42)-(43) (repeated here from (40) and (41)):

	1SG.OBJ	2SG.OBJ	
(42)a.	*nəmosotma*	*gəmosotma*	he will leave___
b.	*nəmərima*	*gəmərima*	he will anoint___
(43)a.	*nuŋguma*	*guɣuma*	he will hit___
b.	*niŋgima*	*giɣma*	he will give to___

In (42)-(43) the verb stems can be seen as /mosot/ 'leave', /məri/ 'anoint', /gu~ɣu/ 'hit' and /gi~ɣi/ 'give to'. The object prefixes show the alternations /nə-~nuŋ-~niŋ-/ '1SG object' and /gə-~gu-~gi-/ '2SG object'. The high vowel changes are explained above in §4.3 Vowel Harmony. In the 1SG object forms there has been an /ŋ/ added to the alternate that precedes a velar stop which is the initial consonant of the verb stem. There are only two verbs that have velar stops in the stem: /gu/ 'hit' and /gi/ 'give to'. However, if other verbs are found which have a velar stop initially, I would expect the same insertion to occur. The UF could include the /ŋ/. It would then require a rule to delete the /ŋ/ everywhere except for preceding /g/. It would be unnatural to insert the /ə/ between two consonants within the same morpheme. So I take the basic form without /ŋ/ and insert in these two cases. So a rule can be formulated as follows:

Object Nasal Insertion-1 (ONI)

$$\emptyset \rightarrow \begin{bmatrix} +\text{nas} \\ -\text{cor} \\ -\text{ant} \end{bmatrix} \quad / \quad V \_\_\_\_ + \quad C \begin{bmatrix} -\text{cor} \\ -\text{ant} \end{bmatrix}$$

[1SG obj]

This rule states that a velar nasal is inserted before a morpheme break in 1st singular object when the stem initial consonant is velar.

I do not think that there are crucial ordering restrictions within these three rules (Spirantisation-1, Vowel Harmony and Object Nasal Insertion) except that applying Vowel Harmony before Spirantisation-1 provides a more plausible phonetic environment for Spirantisation-1 to take place in. I have tried to write the rules to show the rules' independence. The Object Nasal Insertion must also be ordered after ə-Insertion so that the latter rule has the right environment to apply.

ə-Insertion
Vowel Harmony
Object Nasal Insertion

The following sample derivations show the application of all these rules already presented.

UF	#n+gu+m+a#	#g+gi+m+a#	#n+mosot+m+a#	#g+eri+m+a#
ə-I	nə+gu+m+a	gə+gi+m+a	nə+mosot+m+a	g+eri+m+a
VH	nu+gu+m+a	gi+gi+m+a	-----	-----
SP-1	-----	gi+ɣi+m+a	-----	-----
ONI	nuŋ+gu+m+a	-----	-----	-----
SF	[nuŋguma]	[giɣima]	[nəmosotma]	[gerima]
	he'll hit me	he'll give to you	he'll leave me	he'll shoot me

5.5 OBJECT DEGEMINATION

Consider the forms in (44)-(45):

	1PL.OBJ	2/3PL.OBJ	1DU.OBJ	
(44)a.	*neŋgəmosotma*	*eŋgəmosotma*	*nekəmosotma*	he will leave___
b.	*neŋgəmərima*	*eŋgəmərima*	*nekəmərima*	he will anoint___
(45)a.	*neŋguma*	*eŋguma*	*nekuma*	he will hit___
b.	*neŋgima*	*eŋgima*	*nekima*	he will.give to___

These are the same verb stems as in (42)-(43). The object markers show the alternations: /neŋgə-~neŋ-/ '1PL object', /eŋgə-~eŋ-/ '2/3PL object' and /nekə-~ne-/ '1DU object'. The difference in the verb stems is that in (44) the initial consonant is /m/ whereas in (45) the initial consonant is /g/. The /ə/ Insertion has somehow been blocked in the /g/-initial verb stems and a velar consonant has been deleted. Looking at the Underlying Form for these examples in (45) we can see that two velar consonants start out next to each other.

#neŋg+gi# #neŋg+gu# #eŋg+gu# #eŋg+gi# #nek+gu# #nek+gi#

In the plural forms Degemination could apply immediately (if so ordered) while in the dual form Voicing must first apply before Degemination. However, Degemination must be blocked from applying to singular forms, that is /giɣi/ #g+gi# '2SG object + give'. So a corollary Degemination rule can be formulated.

Object Degemination (ODG)

$$\begin{matrix} C \\ [\alpha F] \end{matrix} \rightarrow \emptyset \; / \; \begin{matrix} C + \_\_\_ \\ [\alpha F] \\ [\text{-singular}] \\ [\text{OBJ Prefix}] \end{matrix}$$

This rule states that a consonant in the Object Prefix is deleted across a morpheme boundary when it follows a like consonant in nonsingular forms.

The deletion of the verb stem initial consonant will block the ə-Insertion for these forms. Voicing and Object Degemination must then be ordered before ə-Insertion to take away the environment that ə-Insertion could apply to. Voicing must be ordered before Object Degemination to make sure the right forms are present.

[[Voicing
  - Object Degemination
  - ə-Insertion]

5.6 GLIDE FORMATION

Some of the forms of this set of verbs show an alternation of a glide and high vowel. Consider the forms in (46):

	1SG.OBJ	3SG.OBJ	
(46)a.	*noɣotsa*	*oɣotsa*	he burns___
b.	*nuaŋgitsa*	*waŋgitsa*	he takes from___
c.	*nuwataŋgətsa*	*wuataŋgətsa*	he persecutes___

As seen previously in (39ff.), the '1SG object' is /n-/ and '3SG object' is Ø as shown clearly in (a). The person-number marker for '3SG' is /-a/ and /-ts~-ds/ is present tense. In the (b-c) forms then we see an alternative of the vowel /u/ with the glide /w/, which occurs word initially.

The following rule can be formulated to account for the above observations:

Glide Formation (GF)

$$\begin{matrix} V \\ [+High] \end{matrix} \rightarrow [-syll] \; / \; \# \_\_\_\_ \; \begin{matrix} V \\ [-High] \end{matrix}$$

This rule states that a high vowel becomes a glide when it occurs word initially preceding a non-high vowel.

Note in /uwutaŋga/ 'persecute' the vowel retains some syllabicity so that the sequence /ww/ does not occur.

5.7 ANOMALIES

There are several different members of the set of object prefixing verbs which are anomalous, that is they do not follow the pattern of other like verb stems or they are the only example of a process and it is difficult to show the validity of a certain rule. The situations concerned are the 3SG forms of /gu/ 'hi' and /gi/ 'give' and /yəɣə/ 'bite' and /ami/ 'take, marry'.

5.7.1 'HIT' AND 'GIVE'

Now consider the form in (47):

	1SG.OBJ	1PL.OBJ	3SG.OBJ	
(47)a.	*nuŋguma*	*neŋguma*	*kwetsa*	he will hit___
b.	*niŋgima*	*neŋgima*	*waŋgima*	he will give to___

The verb stems in all person and numbers except 3SG are or can be derived fron /gu/ 'hit' and /gi/ 'give' (see also (41), (43), (44)). The 3SG form of /gi/ does not have Ø as the object marker, instead it adds a morpheme /waŋ/ which is the one verb in the object prefixing set to do so. One possible explanation can come from comparing this form /waŋgima/ 'he will give him' to /waŋgitma/ 'he will take from him' in which /wangit/ is the verb stem. Semantically these are almost the same action and the Burum people may have modified one of the forms to reflect that they are the same action to them. As for the alternation /kwe~gu/ 'hit', there would be a way to derive /kwe/ from /gu/ as the Underlying Form. It would require at least

two more rules that only apply to this form: Initial Devoicing and e-Insertion-1 (which I present without features).

Initial Devoicing Rule (IDV)

/g/ → /k/ / #____

This rule states that the voiced velar stop becomes voiceless when it occurs word initially.

e-Insertion-1 (eI-1)

Ø → /e/ / #C V___
[-sonorant]
[verb stem]

This rule states that an /e/ is inserted following a stop consonant and vowel when the consonant is word initial in the verb stem.

Note: This verb must be marked as [+Devoicing] and [+e-Insertion-1] in the lexicon. These two must be ordered before the Glide Formation rule, which also must be changed to include CuV in the environment. It seems too complicated for just one form and there should be a more elegant way to deal with this situation. For now I will take the option of a morphologically determined rule and list both forms in the lexicon.

/gu/ → /kwe/ / [3SG]

The Underlying Form /gu/ becomes /kwe/ in '3SG'.

5.7.2 'TAKE' AND 'BITE'

Consider the verb forms in (48):

	1SG.OBJ	2SG.OBJ	2/3PL.OBJ	3SG.OBJ	
(48)a.	*nəmiyək*	*gəmiyək*	*eŋgəmiyək*	*amiyək*	he took___
b.	*nəɣəyək*	*gəɣəyək*	*eŋgəɣəyək*	*yəɣəyək*	he bit___

From the first three columns it appears that the verb stems here are /ə/ initial or C initial with /ə/ insertion. Looking at the last column '3SG object', we see a difference in the verb stem. There is an alternation: /əmi~ami/ 'take' and /əɣə~yəɣə/ 'bite'. These are the only two verb stems with a possibility of /ə/ initially and the result is different in each one. I hesitate to posit a set of rules that would choose one of these alternatives as the base form. The Underlying Form /ami/ for 'take' must delete the /a/ and allow ə-Insertion to take place or change the /a/ to /ə/ in word medial positions where /a/ does occur in other words. The Underlying Form /əmi/ must change the /ə/ to /a/ in word initial position. One of the difficulties with this analysis is that /ə/ does occur word initially in other words: /əne/ 'for nothing'. The second Underlying Form option /əmi/ seems more satisfying if the /ə/ occurs in more forms. Rather that posit a rule to change the vowel, I would like to make another morphologically determined rule.

/əmi/ → /ami/ / [3SG]

The Underlying Form /əmi/ become /ami/ in '3SG'.

The alternations for 'bite' offer a different situation. The phoneme /y/ is either added to 3SG or deleted following a consonant. It seems plausible to delete the /y/ when it follows a

consonant across a morpheme boundary. The phoneme /y/ never participates in any consonant clusters and the deletion blocks ə-Insertion. The following rule can be formulated to account for the above observations.

y-Deletion (y-D)

$$\begin{bmatrix} +\text{son} \\ -\text{syll} \\ -\text{cons} \end{bmatrix} \rightarrow \emptyset \;/\; C\_\_$$

This rule states that a /y/ is deleted when it occurs following a consonant.

Note: A morpheme boundary is not needed here as /y/ would only occur following a consonant when two morphemes come together. The Underlying Form /yəɣə/ would then need to be marked [+y-Deletion] in the lexicon. This rule would necessarily be ordered before ə-Insertion

I would like to present full derivations of some forms in Object Prefixing verbs to show how the rules in this set interact.

Full derivations:

UF	#n+eri+m+a#	#n+gu+m+a#	#nek+gi+m+a#	#g+gi+m+a#
VC	-----	-----	nek+ki+m+a	-----
ODG	-----	-----	ne+ki+m+a	-----
ə-I	-----	nə+gu+m+a	-----	gə+gi+m+a
VH	-----	nu+gu+m+a	-----	gi+gi+m+a
ONI	-----	nuŋ+gu+m+a	-----	-----
SP-1	-----	-----	-----	gi+ɣi+m+a
GF	-----	-----	-----	-----
SF	[nerima]	[nuŋguma]	[nekima]	[giɣima]
	he'll shoot me	he'll hit me	he'll give to us two	he'll give to you

UF	#uaŋgit+m+a#	#g+mosot+m+a#
VC	-----	-----
ODG	-----	-----
ə-I	-----	gə+mosot+m+a
VH	-----	-----
ONI	-----	-----
SP-1	-----	-----
GF	wangit+m+a	-----
SF	[waŋgitma]	[gəmosotma]
	he'll take from him	he will leave you

6. MINOR RULES

There are various forms that seem to show assimilation to the point of articulation of the neighbouring consonant. The changes are usually restricted to certain classes of affixes or stems.

6.1 NASAL ASSIMILATION

Consider these verb forms in (49)-(51):

	FUT.1SG	FUT.2SG	
(49)a.	*kamam*	*kaman*	come
b.	*memam*	*meman*	take
(50)a.	*etmam*	*etman*	come down
b.	*kotmam*	*kotman*	go up
(51)a.	*anmam*	*anman*	go
b.	*deŋmam*	*deŋman*	scatter

In the future tense, which is marked with /-m/ in these forms, the person markers are slightly different from the past or present set: /-am/ '1SG' and /-an/ '2SG'. The verb stems in (49)-(51) are the same as we have seen previously with the addition of /deŋ/ 'scatter'.

Now consider the verbs in (52):

	FUT.1SG	FUT.2SG	
(52)a.	*ekŋam*	*ekŋan*	see
b.	*akŋam*	*akŋan*	do

The verb stems are unchanged from (12): /ek/ 'see' and /ak/ 'do'. And the person markers stay the same as in (49)-(51). There is an alternation of the future tense marker: /-m~-ŋ/. This change in the point of articulation follows a change in the verb stem final consonant: the /ŋ/ occurs after the velar stop /k/. Notice that the velar nasal does not affect the morpheme; that is /deŋmam/ (54b). As the /m/ is not predictable and more common, it will be the base form. A rule to account for the above observations can be formulated as follows:

Future Nasal Assimilation-2 (FNA)

$$\begin{bmatrix} C \\ +nasal \end{bmatrix} \rightarrow \begin{bmatrix} -cor \\ -ant \end{bmatrix} / \begin{bmatrix} C \\ +stop \\ -cor \\ -ant \end{bmatrix} + \_\_\_\_$$

[Future]

This rule states that a nasal that is future tense becomes a velar nasal following a velar stop across a morpheme boundary.

The Future specification is needed here as the sequence /km/ does occur in other forms: /ekmalal/ 'I have habitually seen' and /akmalal/ 'I have habitually done'.

6.2 Other future tense forms

As was seen in examples (49)-(51), the future morpheme is /m/ in most cases. Consider to the forms in (53):

	1SG	1DU	1PL	
(53)a.	*kamam*	*kabit*	*kabin*	come
b.	*etmam*	*etpit*	*etpin*	come down
c.	*anmam*	*anbit*	*anbin*	go

The future morpheme shows this alternation /-m~-b/ with the stop occurring in the 1st person, nonsingular forms. The stem has no effect on it. With /m/ as the base form a rule can be written as follows, making it as general as possible:

Nasal-Stop Rule (N-S)

$$\begin{bmatrix} C \\ +\text{nasal} \\ \alpha F \end{bmatrix} \rightarrow \begin{bmatrix} -\text{nasal} \\ \alpha F \end{bmatrix} \; / \; \begin{bmatrix} 1\text{st person} \\ -\text{singular} \end{bmatrix}$$

[Future]

This rule states that the nasal in the future tense becomes a stop at the same point of articulation in 1st person, nonsingular forms.

There is a further change in the future. Look at the forms in (54):

	1SG	1DU	1PL	
(54)a.	*ekŋam*	*ekit*	*ekin*	see
b.	*akŋam*	*akit*	*akin*	do

Here the nonsingular forms of /k/ final verb stems have a further deletion. And it seems to occur preceding the high vowel. So a rule could be formulated to delete the Future morpheme before a high vowel even though this seems unlikely.

Tense Deletion (TD)

$$[\text{Future}] \rightarrow \emptyset \; / \; \begin{bmatrix} C \\ +\text{stop} \\ -\text{cor} \\ -\text{ant} \end{bmatrix} \; \underline{\quad} \; \begin{bmatrix} V \\ +\text{High} \end{bmatrix}$$

This rule states that the future morpheme (whatever quality it is) is deleted between a velar stop and a high vowel.

UF	#ek+m+in#	#ek+m+an#
FNA	-----	ek+N+an
N-S	ek+b+in	-----
TD	ek+Ø+in	-----
VC	-----	-----
SF	[ekin]	[ekŋan]
	we will see	you will see

However by simply ordering the Future Nasal Assimilation and Nasal-Stop before Voicing, Spirantisation and Degemination, the same form would be obtained, so Tense Deletion is not needed.

UF	#ka+m+in#	#et+m+it#	#ek+m+am#	#ek+m+in#
FNA	-----	-----	ek+ŋ+am	ek+ŋ+in
N-S	ka+b+in	et+b+it	-----	ek+g+in
VC	-----	et+p+it	-----	ek+k+in
SP	-----	-----	-----	-----
DG	-----	-----	-----	ek+Ø+in
SF	[kabin]	[etpit]	[ekŋam]	[ekin]
	we will come	we.2 will come down	I will see	we will see

6.3 IDENTICAL SYLLABLE REDUCTION

Consider the forms in (55)-(57):

		PST.2/3DU
(55)a.	*maloɣot*	be
b.	*anoɣot*	go
(56)a.	*eroɣot*	come down
b.	*koroɣot*	go up
(57)a.	*aɣot*	do
b.	*eɣot*	see

Comparing these forms with (30)-(35), the verb stems in (55) can be isolated as /mal/ 'be' and /an/ 'go'. In (56), /er/ 'come down' and /kor/ 'go up' are apparent, which we derive from base forms /et/ and /kot/ (see Spirantisation rule). In (57), the stems seem to be /aɣ/ 'do' and /eɣ/ 'see', with base forms /ak/ and /ek/. We are left with the '2/3DU' marker which shows the alternation /-oɣot~-ot/. In (57) /oɣ/ has been deleted, giving /aɣot/ and /eɣot/ for the expected forms /aɣoɣot/ and /eɣoɣot/. Notice that the Spirantisation rule in this case yields two identical syllables, that is /ɣoɣo/, and one of them is dropped.

A rule that deletes this sequence can be formulated:

Identical Sequence Drop (ISD)

$$C_1V_1 \rightarrow \emptyset \;/\; C(V)\_\_\_\_C_1V_1$$

This rule states that a CV sequence is deleted when it occurs preceding an identical sequence medially following a consonant and an optional vowel.
Condition: Sequence must be the result of some morphophonemic process as there are acceptable forms with identical syllables; that is /indzarere/ 'lazy', /dzidzibu/ 'type of mushroom'.

6.4 STOP ASSIMILATION

The Same Subject verb marker shows alternations in form. Consider the forms in (58)-(62):

		___and
(58)a.	*dzeba*	burn
b.	*memba*	take
(59)a.	*anda*	go
b.	*deŋda*	scatter
(60)a.	*saɣata*	cry
b.	*eta*	come down
(61)a.	*mala*	be
b.	*ala*	put
(62)a.	*eka*	see
b.	*aka*	do

Most of these verb stems have been discussed previously, so I will not list them. The various alternations of the Same Subject morpheme are as follows: /-ba (58)~-da (59)~-a (60)-(62)/. The initial stop changes point of articulation and some are deleted altogether. The final

segment of the verb stem determines the changes to be effected. I assume as with other rules that the base form is that which occurs following a vowel as in (58a) /dzeba/.

A proposed rule then must assimilate /b/ to the preceding consonant so that they agree in features except for voicing. In the environment following a nasal that is not bilabial (see also (59)), the stop assimilates to the alveolar point of articulation. For example, following an alveolar stop /t/, the base form changes to a /d/ and then is devoiced according to the Voicing rule and then undergoes degemination. This also preserves phonetic similarity (see also (60)). So a rule can be written as:

Stop Assimilation (SA)

$$\begin{bmatrix} C \\ -cont \\ +ant \\ -cor \end{bmatrix} \rightarrow \left\{ \begin{array}{llll} [+cor] & / & \left\{ \begin{bmatrix} [+cor] \\ \\ \end{bmatrix}, \begin{bmatrix} +nasal \\ -cor \\ +ant \end{bmatrix} \right\} & \_\_\_\_ \\ [-ant] & / & \begin{bmatrix} -ant \\ -cor \end{bmatrix} & \_\_\_\_ \\ [+lateral] & / & \begin{bmatrix} C \\ +lateral \end{bmatrix} & \_\_\_\_ \end{array} \right. / [\text{Same Subject}]$$

This rule states that a labial stop in the Same Subject morpheme becomes an alveolar stop following an alveolar consonant or a nonlabial nasal. It becomes a velar following a velar stop consonant. It also becomes a lateral following a lateral consonant.

The Same Subject must be part of the rule as the consonant sequences /nb/ /kun+buk/ 'more, again', /ŋb/ /kriŋputput/ 'k.o. insect' and /lb/ /kəlbot/ 'a bush animal' all occur.

The Siawari dialect seems to have collapsed two parts of the rule so the /k/ final stems have the alveolar alternation: for example /ekta/ 'see and (Siawari)'. It has also taken the form following a vowel and has applied Spirantisation rule to it, for example /dzewa/ 'burn and (Siawari)'.

Stop Assimilation must be ordered before Voicing and Degemination in order to feed those rules.

Sample derivations:

UF	#deŋ+ba#	#mal+ba#	#et+ba#	#ek+ba#
SA	deŋ+da	mal+la	et+da	ek+ga
VC	-----	-----	et+ta	ek+ka
DG	-----	mal+a	et+a	ek+a
SF	[deŋda]	[mala]	[eta]	[eka]
	scatter and	be and	come down and	see and

6.5 STEM FINAL /m/

There are two verb stems in the Somba dialect that have forms where an /m/ is present in a few forms but is otherwise deleted. Most consonant final stems show no alternation. In word final position, vowel final verb stems take /m/ as an infinitive marker and consonant stems do not. Consider the forms in (63)-(65):

	PRES.1SG	Infinitive	
(63)a.	*aldzal*	*al*	put
b.	*mətsal*	*mət*	know
(64)a.	*katsal*	*kam*	come
b.	*dzitsal*	*dzim*	say
(65)a.	*metsal*	*mem*	take
b.	*netsal*	*nem*	eat

In (63), the verb stems are /al/ 'put' and /mət/ 'know'. In (64), the verb stems can be isolated as /ka/ 'come' and /dzi/ 'say'. And in (65), it seems that the stems are /me/ 'take' and /ne/ 'eat'. However consider the first plural forms of these same verbs in (66)-(68):

	FUT.1PL	
(66)a.	*albin*	put
b.	*mətpin*	know
(67)a.	*kabin*	come
b.	*dzibin*	say
(68)a.	*membin*	take
b.	*nembin*	eat

The future 1st plural marker is /-in/ and the future marker here is /-b~-p/ (see §5.3). The consonant final stems in (63) and (66) and the vowel final stems in (64) and (67) remain the same. When we compare (68) with (65), we see an alternation in these stems as /ne~nem/ 'eat' and /me~mem/ 'take'. The /m/ shows up preceding /b/ but there is nothing else to predict the occurrence of /m/ there. If we posit that this /m/ is part of the stem and is deleted in all cases except before /b/, it satisfies the environment. In all other forms, /nem/ and /mem/ behave like vowel final stems. It is also possible that the nasal at the beginning of the stem may be causing the /m/ to be retained or even inserted before the /b/. I have no evidence at the moment which would prove conclusively one way or the other. The patterns so far in Burum tend to give more plausibility to the stem /m/ deletion as no other process is governed by nonadjacent segments. So a rule can be written as follows:

Stem /m/ Deletion (SmD)

$$\begin{bmatrix} +\text{nas} \\ +\text{ant} \\ -\text{cor} \end{bmatrix} \rightarrow \emptyset \; / \; \underline{\quad} \; \left\{ \begin{bmatrix} \text{V} \\ \text{C} \\ -\text{cor} \\ +\text{ant} \end{bmatrix} \right.$$

[Verb stem]

This rule states that the verb stem final /m/ is deleted in non-word final positions before a vowel or consonant that is not bilabial.

	Sample derivations:		
UF	#al+b+in#	#mem+b+in#	#nem+ts+al#
SmD	-----	-----	ne+ts+al
SF	[albin]	[membin]	[netsal]
	we will put	we will take	I eat

6.6 HABITUAL MARKER

Consider the forms in (69)-(70):

	HAB.PRES.1SG	HAB.PST.1SG	
(69)a.	*anaktsal*	*anmalal*	go
b.	*eraktsal*	*etmalal*	come down
(70)a.	*kamaktsal*	*kamalal*	come
b.	*memaktsal*	*memalal*	take

The past habitual marker is /-mal/ which occurs immediately following the verb stem before the tense markers or person-number markers. The habitual present shows the alternation /-ak~-mak/.[10] The alternation beginning with a vowel occurs after consonant final stems, that is /an/ 'go', and the alternation with a consonant follows vowel final stems, that is /ka/ 'come'. So the stem final segment determines the allomorph. Nothing in the environment necessarily predicts the insertion of /m/ so I take the /m/ alternation as the base form, that is /-mak/. A rule can be written as follows:

Habitual m-Reduction (HmD)

$$\begin{bmatrix} +\text{nas} \\ +\text{ant} \\ -\text{cor} \end{bmatrix} \rightarrow \emptyset \quad / \quad C + \_\_\_\_$$

[Habitual]
[-Past]

This rule states that the /m/ in the habitual, non-past marker is deleted following a consonant.

This rule must take place before the Spirantisation rule to ensure the correct form, that is in [eraktsal] < /et+mak+ts+al/.

	Sample Derivations:	
UF	#ka+mak+ts+al#	#et+mak+ts+al#
HmD	-----	et+ak+ts+al
SP	-----	er+ak+ts+al
SF	[kamaktsal]	[eraktsal]
	I habitually come	I habitually come down

10 There could be a relationship between /-mal/ 'habitual past' and /mal/ 'to be' and /-ak , -mak/ 'present habitual' and /ak/ 'to do'. However I do not have enough information to make a decision at this time. These verbs would be likely candidates for a relationship of this kind.

6.7 NASAL INSERTION

Consider the forms in (71)-(72):

	PST.1SG	PST.3SG	PST.1DU	PST.1PL	
(71)a.	*malal*	*maləkˀ*	*malit*	*malin*	be
b.	*anal*	*anəkˀ*	*anit*	*anin*	go
(72)a.	*deŋnal*	*deŋnəkˀ*	*deŋnit*	*deŋnin*	scatter
b.	*usuŋnal*	*usuŋnəkˀ*	*usuŋnit*	*usuŋnin*	clean

The verb stems in (71) are /mal/ 'be' and /an/ 'go'. In (72), the verb stems can be isolated as /deŋ/ 'scatter' and /usuŋ/ 'clean'. This leaves the following alternation of the person-number markers:

/-al~-nal/ 1SG
/-əkˀ~-nəkˀ/ 3SG
/-it~-nit/ 1DU
/-in~-nin/ 1PL

The /n/ occurs following a velar nasal stem final consonant. I assume the vowel initial suffix is the base form as it occurs in more environments.

Verbal Nasal Insertion (VNI)

$$\emptyset \rightarrow \begin{bmatrix} +\text{nas} \\ +\text{ant} \\ -\text{cor} \end{bmatrix} \; / \; \begin{bmatrix} +\text{nas} \\ -\text{ant} \\ -\text{cor} \end{bmatrix} + \underline{\quad} \; \text{V} \quad [\text{Verb stem}]$$

This rule states that an alveolar nasal is inserted after a velar nasal in a verb stem before a vowel of a suffix across a morpheme boundary.

6.8 i REDUCTION

Consider the forms in (73):

	_____#	in___	like____	
(73)a.	*nup*	*nuwe*	*nup ewə*	garden
b.	*miri*	*mire*	*miri ewə*	house, village
c.	*ki*	-----	*kewə*	that

The first column shows the unaffixed forms of these words. In the second column /-e/ is a locative which occurs following possessive suffixes and a few non-human nouns such as in the examples above. The particle /ewə/ 'like' is usually a separate word but in a few forms it is affixed because Spirantisation does not apply to the separate word forms, that is /nup ewə/ not */nuw ewə/. When these particles are added to words that end with /i/, that /i/ is deleted. One explanation for this process is that both /i/ and /e/ are front vowels. In other forms, that is /keya/ 'rain (emphatic)', /alayəkˀ/ 'only a friend', /bauya/ 'pig (emphatic)', different processes take place, for example y-Epenthesis. The following rule can be formulated to account for the above observations:

i-Deletion (i-D)

$$\begin{bmatrix} \text{V} \\ +\text{high} \\ -\text{back} \end{bmatrix} \rightarrow \text{Ø} \quad / \quad \_\_+ \begin{bmatrix} \text{V} \\ -\text{back} \\ -\text{low} \\ -\text{high} \end{bmatrix}$$

This rule states that /i/ is deleted when it occurs preceding /e/ across a morpheme boundary.

Note this does not apply across a word boundary.

6.9 CONSONANT DROP

There is an optional rule which may be dialectal where the final consonants of some kinds of words and clitics are dropped. Consider the forms in (74):

	he___	+customary	+relativiser	
(74)a.	*katsa*	*katsapma*	*katsaβi*	come
b.	*dzitsa*	*dzitsapma*	*dzitsaβi*	say

The verb stems are /ka/ 'come' and /dzi/ 'say'. The present tense is marked by /ts/ while /ma/ means 'customary action' and /i/ 'determiner' acts as a relativiser. The 3SG marker shows the alternation [-a~-ap~-aβ]. The spirant is predicted by the Spirantisation rule (§3.2). The final consonant is deleted in word final position.

Optional Consonant Reduction (CD)

$$\begin{bmatrix} \text{C} \\ -\text{son} \end{bmatrix} \rightarrow \text{Ø} \quad / \quad \_\_\_\#$$

This rule states that a stop consonant is deleted in word final position.

Note: This rule affects only a few morphemes: /-ap/ '3SG (present)', /-ap/ 'emphasis' and /-gət/ 'referential clitic'.

Examples of the latter two morphemes are as follows:

muneŋ-a	a lie!	
muneŋ-aβ-e	just a lie!	/e/ 'angry determiner'
atsi-gə~atsi-gət	of the man	
atsi-gəreŋ	at the place of the man	/eŋ/ 'locative clitic'

6.10 TOPIC CLITIC

Consider the forms in (75):

	Topic	Poss'd Topic	LOC Topic	
(75)a.	*ambinəŋ*	*ambigan*	*ambigəreŋ*	man
b.	*alanəŋ*	*alagan*	*alagəreŋ*	friend

The noun roots here can be separated as /ambi/ 'man' and /ala/ 'friend'. In the second column, /g/ can be separated as '2SG possessive' and /gər/ in the third column is 'locative'. The Topic markers then show the following alternatives: /nəŋ~an~eŋ/. There is another form

of the Topic marker that does not occur with nouns but with personal interrogatives, demonstratives and pronouns.

(76)a. *daŋən* who
b. *miekŋən* those two
c. *yaŋən* he

In this example, /da/ is 'who', /mi/ 'that, those', and /y/ '3 person', while /-ek/ 'dual' and /-aŋ/ '3SG' are the forms of the Nominaliser clitic which occurs with pronouns and any other clitic. The Topic allomorph here is /-ŋən~-ən/. There was a Degemination of the /ŋ/ in the (c) form. So the forms of the Topic clitic are /-nəŋ~-an~-eŋ~-ŋən/. It might be possible to derive all of these forms from a single Underlying Form but it would require several rules and you would have to include grammatical information anyway so I feel it would be best to treat these as morphologically determined suppletive allomorphs for the present.

Topic Rule (TP)

$$\text{Topic} \rightarrow \begin{cases} \text{/-nəŋ/} \;/\; [\text{noun}, \text{nonpers interr}] & + \_\_\_\_ \\ \text{/-ŋən/} \;/\; [[\text{pers pronoun}, \text{demonstrative +NOM Clitic}], \text{pers interr}] & + \_\_\_\_ \\ \text{/-an/} \;/\; [\text{noun +possessive}, \text{indef pronoun + 3s poss}] & + \_\_\_\_ \\ \text{/-eŋ/} \;/\; \text{noun +locative} & + \_\_\_\_ \end{cases}$$

This rule states that the form /nəŋ/ occurs following a noun with no other clitics or a nonpersonal interrogative. While /ŋən/ occurs following personal pronoun or demonstrative with the Nominaliser Clitic or with a personal interrogative. The form /an/ occurs following a noun with a possessive suffix or adjectiviser or indefinite pronoun. And the form /eŋ/ occurs only following /gət/ 'locative'.

APPENDIX 1

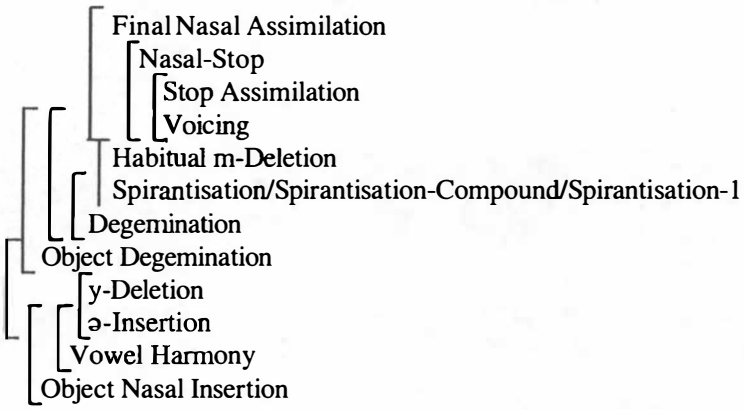
Distinctive Feature Matrix

	p	b	t	d	k	g	kw	gw	s	ts	dz	w	r	ɣ	l	m	n	ŋ	y	i	e	ə	a	o	u
syllabic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+
conson'l	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	-	-	-	-	-	-	-
sonorant	-	-	-	-	-	-	-	-	-	-	-	+	+	-	+	+	+	+	+	+	+	+	+	+	+
contin	-	-	-	-	-	-	-	-	+	-	-	+	+	+	-	-	-	-	+						
voice	-	+	-	+	-	+	-	+	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
coronal	-	-	+	+	-	-	-	-	+	+	+	-	+	-	+	-	+	-	+						
anterior	+	+	+	+	-	-	-	-	+	+	+	-	+	-	+	+	+	-	-						
nasal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-						
lateral	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-						
round	-	-	-	-	-	-	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	+
del rel	-	-	-	-	-	-	+	+	-	+	+	-	-	-	-	-	-	-	-						
high	-	-	-	-	-	-	+	+	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	-	+
back	-	-	-	-	+	+	+	+	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	+	+
low																				-	-	-	+	-	-

APPENDIX 2

Summary of Rules

The following is a summary of all the rules presented in the paper. The number in brackets in the first line is the section where the rule is discussed. First is a listing of the rules that are crucially ordered.



Degemination (DG) [§3.1]

$$\begin{matrix} C \\ [\alpha F] \end{matrix} \rightarrow \emptyset \; / \; \begin{matrix} C \\ [\alpha F] \end{matrix} \_\_$$

This rule states that a consonant is deleted when it occurs following another identical consonant.

Spirantisation (SP) [§3.2]

$$\begin{bmatrix} C \\ -\text{sonorant} \\ -\text{voice} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{cont} \\ +\text{voice} \end{bmatrix} \; / \; V \_\_ + V$$

This rule states that a voiceless stop consonant becomes a voiced spirant when it occurs between vowels across a morpheme boundary.

Spirantisation-Compound (SpC) [§3.2]

$$\begin{bmatrix} C \\ -\text{sonorant} \\ -\text{voice} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{cont} \\ +\text{voice} \end{bmatrix} \; / \; \begin{matrix} V \\ [\alpha F] \end{matrix} \; \_\_\_\_ \# \; \begin{matrix} V \\ [\alpha F] \end{matrix}$$

This rule states that a voiceless stop consonant becomes a voiced spirant if it occurs between two like vowels across a word boundary and the consonant is word final.

C → [α voice] / C ___
[-sonorant] [α voice]

This rule states that a stop consonant agrees in voicing when it occurs following another consonant.
Condition: The rule does not apply where the form is reduplicated nor a compound, that is /kinkin/ 'the standing' see also /kin/ 'to stand', /təmuntəmun/ 'snail' see also /təmun/ 'shell'.

y-Epenthesis (y-E) [§3.4]

$$\emptyset \rightarrow \begin{bmatrix} -\text{syll} \\ -\text{cons} \\ +\text{high} \\ -\text{back} \end{bmatrix} / \; V + \underline{\quad} \; V \quad [-\text{High}]$$

This rule states that a /y/ is inserted between two vowels across a morpheme boundary if the second vowel is not high.

Pronoun Nasal Assimilation (PNA) [§4.1]

C → [α point] / ____+ C
[+nasal] [α point]
[Topic/NOM Clitic]

This rule states that a nasal in the Nominaliser/Topic clitic becomes the same point of articulation as the stop it precedes across a morpheme boundary.

Spirantisation-1 (SP-1) [§4.2 and §5.2]

$$\begin{bmatrix} -\text{cont} \\ -\text{cor} \\ -\text{ant} \\ +\text{voice} \end{bmatrix} \rightarrow [+\text{cont}] \quad / \; V + \underline{\quad} V \quad [\alpha F] \; [\alpha F] \quad [2\text{nd singular}]$$

This rule states that the velar voiced stop becomes the velar spirant when it occurs between like vowels and across a morpheme boundary.
Condition: This rule only applies to 2SG.

ə-Insertion (ə-I) (§5.1)

Ø → /ə/ / # C____ + C
C
[OBJ Prefix]

This rule states that a /ə/ is inserted between two consonants when the first consonant is word initial or follows another consonant in the object prefix.

Vowel Harmony (VH) [§5.3]

$$\underset{\text{[OBJ Prefix]}}{/ə/} \rightarrow \begin{bmatrix}+\text{High}\\ \alpha\text{Back}\end{bmatrix} \; / \; \_\_\_\_\_ (C) + C \; \underset{\begin{bmatrix}+\text{High}\\ \alpha\text{Back}\end{bmatrix}}{V}$$

This rule states that a /ə/ that is in the object prefix becomes High and agrees in Backness with a following high vowel. There may be one to two intervening consonants and there must be at least one, across the morpheme boundary, as the vowel /ə/ only occurs before consonants.

Object Nasal Insertion-1 (ONI) [§5.4]

$$\emptyset \rightarrow \begin{bmatrix}+\text{nas}\\ -\text{cor}\\ -\text{ant}\end{bmatrix} \; / \; V \_\_\_\_ + \; \underset{\text{[1SG OBJ]}}{\begin{bmatrix}-\text{cor}\\ -\text{ant}\end{bmatrix}}$$

This rule states that a velar nasal is inserted before a morpheme break in 1st singular object when the stem initial consonant is velar.

Object Degemination (ODG) [§5.5]

$$\underset{\substack{[\alpha F]\\ [-\text{singular}]\\ [\text{OBJ Prefix}]}}{C} \rightarrow \emptyset \; / \; \underset{[\alpha F]}{C} + \_\_\_$$

This rule states that a consonant in the Object Prefix is deleted across a morpheme boundary when it follows a like consonant in nonsingular forms.

Glide Formation (GF) [§5.6]

$$\underset{[+\text{High}]}{V} \rightarrow [-\text{syll}] \; / \; \# \_\_\_\_ \; \underset{[-\text{High}]}{V}$$

This rule states that a high vowel becomes a glide when it occurs word initially preceding a non-high vowel.

y-Deletion (y-D) [§5.7]

$$\begin{bmatrix}+\text{son}\\ -\text{syll}\\ -\text{cons}\end{bmatrix} \rightarrow \emptyset \; / \; C \_\_\_$$

This rule states that a /y/ is deleted when it occurs following a consonant.

Future Nasal Assimilation (FNA) [§6.1]

$$\begin{bmatrix} C \\ +nasal \end{bmatrix} \rightarrow \begin{bmatrix} -cor \\ -ant \end{bmatrix} \; / \; \begin{bmatrix} C \\ +stop \\ -cor \\ -ant \end{bmatrix} \; + \_\_\_\_$$

[Future]

This rule states that a nasal that is future tense becomes a velar nasal following a velar stop across a morpheme boundary.

Nasal-Stop Rule (N-S) [§6.2]

$$\begin{bmatrix} C \\ +nasal \\ \alpha F \end{bmatrix} \rightarrow \begin{bmatrix} -nas \\ \alpha F \end{bmatrix} \; / \; \begin{bmatrix} 1st\ person \\ -singular \end{bmatrix}$$

[Future]

This rule states that the nasal in the future tense becomes a stop at the same point of articulation in 1st person, nonsingular forms.

Identical Sequence Drop (ISD) [§6.3]

$$C1\ V1 \rightarrow \emptyset \; / \; C(V) \_\_\_\_ C1\ V1$$

This rule states that a CV sequence is deleted when it occurs preceding an identical sequence medially following a consonant and an optional vowel.
Condition: Sequence must be the result of some morphophonemic process as there are acceptable forms with identical syllables; that is /indzarere/ 'lazy', /dzidzibu/ 'type of mushroom'.

Stop Assimilation (SA) [§6.4]

$$\begin{bmatrix} C \\ -cont \\ +ant \\ -cor \end{bmatrix} \rightarrow \begin{cases} [+cor] \; / \; \left\{ \begin{bmatrix} [+cor] \\ \\ \begin{bmatrix} +nasal \\ -cor \\ +ant \end{bmatrix} \end{bmatrix} \right\} \_\_\_\_ \\ [-ant] \; / \; \begin{bmatrix} -ant \\ -cor \end{bmatrix} \_\_\_\_ \\ [+lateral] \; / \; \begin{bmatrix} C \\ +lateral \end{bmatrix} \_\_\_\_ \end{cases}$$

[Same Subject]

This rule states that a labial stop in the Same Subject morpheme becomes an alveolar stop following an alveolar consonant or a nonlabial nasal. It becomes a velar following a velar stop consonant. It also becomes a lateral following a lateral consonant.

Stem m-Deletion (SmD) [§6.5]

$$\begin{bmatrix}+\text{nas}\\+\text{ant}\\-\text{cor}\end{bmatrix} \rightarrow \emptyset \;/\; \underline{\quad} \begin{Bmatrix}\text{V}\\\begin{bmatrix}\text{C}\\-\text{cor}\\+\text{ant}\end{bmatrix}\end{Bmatrix}$$

[Verb stem]

This rule states that the verb stem final /m/ is deleted in non-word final positions before a vowel or consonant that is not bilabial.

Habitual m-Deletion (HmD) [§6.6]

$$\begin{bmatrix}+\text{nas}\\+\text{ant}\\-\text{cor}\end{bmatrix} \rightarrow \emptyset \;/\; \text{C} + \underline{\quad}$$

[Habitual]
[-Past]

This rule states that the /m/ in the habitual, non-past marker is deleted following a consonant.

Verbal Nasal Insertion (VNI) [§6.7]

$$\emptyset \rightarrow \begin{bmatrix}+\text{nas}\\+\text{ant}\\-\text{cor}\end{bmatrix} \;/\; \begin{bmatrix}+\text{nas}\\-\text{ant}\\-\text{cor}\end{bmatrix} + \underline{\quad}\,\text{V}$$

[Verb stem]

This rule states that an alveolar nasal is inserted after a velar nasal in a verb stem before a vowel of a suffix across a morpheme boundary.

i-Deletion (i-D) [§6.8]

$$\begin{bmatrix}\text{V}\\+\text{high}\\-\text{back}\end{bmatrix} \rightarrow \emptyset \;/\; \underline{\quad}+ \begin{bmatrix}\text{V}\\-\text{back}\\-\text{low}\\-\text{high}\end{bmatrix}$$

This rule states that a /i/ is deleted when it occurs preceding /e/ across a morpheme boundary.

Optional Consonant Deletion (CD) [§6.9]

$$\begin{bmatrix}\text{C}\\-\text{son}\end{bmatrix} \rightarrow \emptyset \;/\; \underline{\quad}\#$$

This rule states that a stop consonant is deleted in word final position.

Topic Rule (TP) [§6.10]

$$\text{Topic} \rightarrow \begin{cases} \text{/-nəŋ/} \;/\; \begin{bmatrix}\text{noun}\\ \text{nonpers interr}\end{bmatrix} & + \_\_\_\_ \\ \text{/-ŋən/} \;/\; \begin{bmatrix}\begin{bmatrix}\text{pers pronoun}\\ \text{demonstrative +NOM Clitic}\end{bmatrix}\\ \text{pers interr}\end{bmatrix} & + \_\_\_\_ \\ \text{/-an/} \;/\; \begin{bmatrix}\text{noun +possessive}\\ \text{indef pronoun + 3s poss}\end{bmatrix} & + \_\_\_\_ \\ \text{/-eŋ/} \;/\; \text{noun +locative} & + \_\_\_\_ \end{cases}$$

This rule states that the form /nəŋ/ occurs following a noun with no other clitics or a nonpersonal interrogative. While /ŋən/ occurs following personal pronoun or demonstrative with the Nominaliser Clitic or with a personal interrogative. The form /an/ occurs following a noun with a possessive suffix or adjectiviser or indefinite pronoun. And the form /eŋ/ occurs only following /gət/ 'locative'.

APPENDIX 3

Formulas and Affixes

1. Verbs

The formula stating the order of affix classes for the basic final verb in Burum-Mindik is as follows:

+object +verb stem +aspect +tense +person-number +mode

There are co-occurrence restrictions in the choice of verb affixes. For more information see Olkkonen and Olkkonen (1983). There are slightly different person-number sets for subject according to tense and object.

Object Prefix Person-Number Set

	SG	DU	PL
1	/n/	/nek/	/neŋg/
2	/g/	/ek/	/eŋg/
3	Ø		

[waŋ,y,Ø]

Subject Person Number Sets

With Present Tense

	SG	DU	PL
1	/al/	/it/	/in/
2	/an/	/aɣot/	/e/
3	/ap/		

With Future Tense

	SG	DU	PL
1	/am/	/it/	/in/
2	/an/	/aɣot/	/e/
3	/a/		

With Past Tense

	SG	DU	PL
1	/al/	/it/	/in/
2	/nəŋ/	/oɣot/	/get/
3	/ək/		

With Irrealis Aspect

	SG	DU	PL
1	/ileŋ/	/it/	/in/
2	/an/	/aɣot/	/e/
3	/ap/		

The medial verb with Different Subject marker has this set of Person Number markers:

	SG	DU	PL
1	/al/	/tsi/	/in/
2	/nəŋ/	/oɣot/	/get/
3	/i/		

2. Non-verbs

See Appendix 3, §3 Pronoun Processes for sets of pronoun roots and other clitics that occur with pronouns. Here I will show some representative sets of non-verb markers.

Nominative pronouns are Class I roots with determiner clitic which is deleted in word medial positions.

	SG	DU	PL
1	/ni/	/niri/	/nini/
2	/gi/	/iŋiri/	/iŋini/
3	/i/		

Possessive Suffix for nouns

	SG	DU	PL
1	/-ni/	/-niri/	/-nini/
2	/-gi/	/-ŋiri/	/-ŋini/
3	/-ŋi/		

Class 1 Pronoun Roots

	SG	DU	PL
1	/n-/	/nir-/	/nin-/
2	/g-/	/ŋir-/	/ŋin-/
3	/ŋ/		

Class 2 Pronoun Roots

	SG	DU	PL
1	/n-/	/n-/	/n-/
2	/g-/	/y/	ø
3	/y-/		

3. Other clitics and suffixes

There are other suffixes and clitics which occur on verbs and nouns in Burum-Mindik. I will simply list them. For more information and restrictions see Olkkonen and Olkkonen (1983) and S. Olkkonen (1986).

-eŋ	locative	*-ap*	emphasis
-buk	with	*-təp*	a little
-ək	only/from	*-{nəŋ}*	Topic clitic
-i	determiner/relativiser	*-e*	locative/angry emphatic
-i/u(hi/hu)	verbaliser	*-ŋi*	adjectiviser
-m	infinitive	*-gu*	sequence emphasiser
ewə	like	*gərəken*	toward
dop	analogous	*-mə*	adversative

-n 'reference to me' occurs with certain locative nouns
-k 'reference to you' occurs with certain locative nouns
nan- 'self', prefix on Class I pronoun roots
-gət possessor/verbaliser/purpose/referential clitic

Verbal Paradigms

Present

	come	go up	see	scatter
1SG	*katsal*	*kotsal*	*ektsal*	*deŋdzal*
2SG	*katsan*	*kotsan*	*ektsan*	*deŋdzan*
3SG	*katsa*	*kotsa*	*ektsa*	*deŋdza*
1DU	*katsit*	*kotsit*	*ektsit*	*deŋdzit*
2/3DU	*katsaɣot*	*kotsaɣot*	*ektsaɣot*	*deŋdzaɣot*
1PL	*katsin*	*kotsin*	*ektsin*	*deŋdzin*
2/3PL	*katse*	*kotse*	*ektse*	*deŋdze*

Future

1SG	*kamam*	*kotmam*	*ekŋam*	*deŋmam*
2SG	*kaman*	*kotman*	*ekŋan*	*deŋman*
3SG	*kama*	*kotma*	*ekŋa*	*deŋma*
1DU	*kabit*	*kotpit*	*ekit*	*deŋbit*
2/3DU	*kamaɣot*	*kotmaɣot*	*ekŋaɣot*	*deŋmaɣot*
1PL	*kabin*	*kotpin*	*ekin*	*deŋbin*
2/3PL	*kame*	*kotme*	*ekŋe*	*deŋme*

Past

1SG	*kayal*	*koral*	*eɣal*	*deŋnal*
2SG	*kanəŋ*	*kotnəŋ*	*eknəŋ*	*deŋnəŋ*
3SG	*kayək*	*korək*	*eɣək*	*deŋnək*
1DU	*kait*	*korit*	*eɣit*	*deŋnit*
2/3DU	*kayaɣot*	*koroɣot*	*eɣot*	*denŋoɣot*
1PL	*kain*	*korin*	*eɣin*	*deŋnin*
2/3PL	*kaget*	*kotket*	*eket*	*deŋget*

Different Subject Medial verb

1SG	*kayalga*	*koralga*	*eɣalga*	*deŋnalga*
2SG	*kanəŋga*	*kotnəŋga*	*eknəŋga*	*deŋnəŋga*
3SG	*kaiga*	*koriga*	*eɣiga*	*deŋniga*
1DU	*katsiga*	*kotsiga*	*ektsiga*	*deŋdziga*
2/3DU	*kayoɣotka*	*koroɣotka*	*eɣotka*	*deŋnoɣotka*
1PL	*kainga*	*koringa*	*eɣinga*	*deŋninga*
2/3PL	*kagetka*	*kotketka*	*eketka*	*deŋgetka*

Same Subject Medial Verbs

	kaba	*kota*	*eka*	*deŋda*

Infinitive

	kam	*kot*	*ek*	*deŋ*

Habitual Present

1SG	*kamaktsal*	*koraktsal*	*eɣaktsal*	*deŋaktsal*
2SG	*kamaktsan*	*koraktsan*	*eɣaktsan*	*deŋaktsan*
3SG	*kamaktsa*	*koraktsa*	*eɣaktsa*	*deŋaktsa*
1DU	*kamaktsit*	*koraktsit*	*eɣaktsit*	*deŋaktsit*
2/3DU	*kamaktsaɣot*	*koraktsaɣot*	*eɣaktsaɣot*	*deŋaktsaɣot*
1PL	*kamaktsin*	*koraktsin*	*eɣaktsin*	*deŋaktsin*
2/3PL	*kamaktse*	*koraktse*	*eɣaktse*	*deŋaktse*

Habitual Future

1SG	*kamakŋam*	*korakŋam*	*eɣakŋam*	*deŋakŋam*
2SG	*kamakŋan*	*korakŋan*	*eɣakŋan*	*deŋakŋan*
3SG	*kamakŋa*	*korakŋa*	*eɣakŋa*	*deŋakŋa*
1DU	*kamakit*	*korakit*	*eɣakit*	*deŋakit*
2/3DU	*kamakŋaɣot*	*korakŋaɣot*	*eɣakŋaɣot*	*deŋakŋaɣot*
1PL	*kamakin*	*korakin*	*eɣakin*	*deŋakin*
2/3PL	*kamakŋe*	*korakŋe*	*eɣakŋe*	*deŋakŋe*

Habitual Past

1SG	*kamalal*	*kotmalal*	*etmalal*	*deŋmalal*
2SG	*kamalnəŋ*	*kotmalnəŋ*	*etmalnəŋ*	*deŋmalnəŋ*
3SG	*kamalək*	*kotmalək*	*etmalək*	*deŋmalək*
1DU	*kamalit*	*kotmalit*	*etmalit*	*deŋmalit*
2/3DU	*kamaloɣot*	*kotmaloɣot*	*etmaloɣot*	*deŋmaloɣot*
1PL	*kamalin*	*kotmalin*	*etmalin*	*deŋmalin*
2/3PL	*kamale*	*kotmale*	*etmale*	*deŋmale*

Irrealis

1SG	*kabileŋ*	*kotpileŋ*	*etpileŋ*	*deŋbileŋ*
2SG	*kaban*	*kotpan*	*etpan*	*deŋban*
3SG	*kabap*	*kotpap*	*etpap*	*deŋbap*
1DU	*kabit*	*kotpit*	*etpit*	*deŋbit*
2/3DU	*kabaɣot*	*kotpaɣot*	*etpaɣot*	*deŋbaɣot*
1PL	*kabin*	*kotpin*	*etpin*	*deŋbin*
2/3PL	*kabe*	*kotpe*	*etpe*	*deŋbe*

Object Prefixing Verbs (all 3SG future Subject)

	call	bite	leave	see
1SG	*noɣolma*	*nəɣəma*	*nəmosotma*	*nekma*
2SG	*goɣolma*	*gəɣəma*	*gəmosotma*	*gekma*
3SG	*oɣolma*	*yəɣəma*	*mosotma*	*ekma*
1DU	*nekoɣolma*	*nekəɣəma*	*nekəmosotman*	*ekekma*
2/3DU	*ekoɣolma*	*ekəɣəma*	*ekəmosotma*	*ekekma*
1PL	*neŋgoɣolma*	*neŋgəɣəma*	*neŋgəmosotman*	*eŋgekma*
2/3PL	*eŋgoɣolma*	*eŋgəɣəma*	*eŋgəmosotma*	*eŋgekma*

	hit	give	take
1SG	*nuŋguma*	*niŋgima*	*nuaŋgitma*
2SG	*guɣuma*	*giɣima*	*guaŋgitma*
3SG	*kwetma*	*waŋgima*	*waŋgitma*
1DU	*nekuma*	*nekima*	*nekuaŋgitma*
2/3DU	*ekuma*	*ekima*	*ekuaŋgitma*
1PL	*neŋguma*	*neŋgima*	*neŋguaŋgitma*
2/3PL	*eŋguma*	*eŋgima*	*eŋguaŋgitma*

Noun Paradigms

Possessive

	flesh	blood	sister	yam	tooth	grease
1SG	*busuni*	*sepni*	*neni*	*koŋni*	*dzitni*	*keləkni*
2SG	*busugi*	*sepki*	*nengi*	*koŋgi*	*dzitki*	*keləki*
3SG	*busuɲi*	*sepɲi*	*nenɲi*	*koɲi*	*dzitɲi*	*kelək■ɲi*
1DU	*busuniri*	*sepniri*	*neniri*	*koŋniri*	*dzitniri*	*keləkniri*
2/3DU	*busuɲiri*	*sepɲiri*	*nenɲiri*	*koɲiri*	*dzitɲiri*	*kelək■ɲiri*
1PL	*busunini*	*sepnini*	*nenini*	*koŋnini*	*dzitnini*	*keləknini*
2/3PL	*busuɲini*	*sepɲini*	*nenɲini*	*koɲini*	*dzitɲini*	*kelək■ɲini*

with__	about__	a little__	really__	
busubuk	*busugə*	*busutəp*	*busuyap*	flesh
sepuk	*sepkə*	*septəp*	*sewap*	blood
nenbuk	*nengə*	*nendəp*	*nenap*	sister
koŋbuk	*koŋgə*	*koŋdəp*	*koŋap*	yam
dzitpuk	*dzitkə*	*dzitəp*	*dzirap*	tooth
keləkpuk	*keləkə*	*keləktəp*	*keləɣap*	grease

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SWITCH-REFERENCE IN PAPUA NEW GUINEA
A PRELIMINARY SURVEY

JOHN R. ROBERTS

1. INTRODUCTION

Major cross-linguistic surveys of the morphosyntactic phenomenon known as switch-reference (SR) have been published in recent years on languages located in two quite different geographical locations, namely Australia (Austin 1981) and North America (Jacobsen 1983).[1] However, apart from Foley's brief overview (1986:183-192) no extensive

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1 The following abbreviations are used:

*	impossible form	DECL	declarative mood
†	MarkSu different from final verb	DEF	definite
< >	encloses representative form	DEL.SEQ	delayed sequence
> <	infix	DEP	dependent
≈	varies with	DES	desiderative
-	affix break	DO	direct object
=	postpositional clitic	DS	different subject following
1	first person	DT	different topic
2	second person	DU	dual
3	third person	DUR	durative aspect
A	agent	E-after-R	event described (by marked verb) occurred after the event described by the following verb
ABS	absolutive case		
AC	actor		
ACC	accusative case	E-before-R	event described (by marked verb) occurred before reference event
AD	addressee deictic		
AdvCLSV	adverbial clause preceding subject	EGO	action is for the benefit of the actor
ALTO	action is for the benefit of s.o. else	EMPH	emphatic
AN	Austronesian	ERG	ergative case
ANTI	antipassive	EXCL	exclusive
AnticSu	anticipatory subject	EXT	extended
A-role	agent's role	F	feminine gender
A/T-S	agent/topic-subject clause	FD.P	far deictic plural
AV	agent's view	FP	far past tense
BEN	benefactive	FUT	future
CAUS	causative	GB	government and binding theory
COMP	completed aspect	HABP	habitual past aspect
COND	conditional	HN	head noun
CONT	continuous aspect	HP	historical past
CONTIG	contiguous action	IMMP	immediate past tense
CONTIN	continuous action	IMP	imperative mood
CONTR	counterfactual mood	IMPFV	imperfective aspect
D	deictic	INC	incomplete aspect
DAT	dative	IND	indicative mood

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survey has been made of SR in Papua New Guinea (PNG), where it occurs in more languages that are geographically adjacent than anywhere else in the world and perhaps has reached its highest levels of diversity and sophistication. The purpose of this article[2] is therefore to present the results of a survey of SR in PNG languages.

IO	indirect object/recipient object	PRED	predicate marker
IRR	irrealis modality	PRES	present tense
IT	iterative aspect	PROG	progressive aspect
*KV	protoform velar + vowel	P-role	patient role
L	locative	PrP	pragmatic pivot
LOC	locative	PUNC	punctual aspect
M	masculine gender	PURP	purpose
MEA	measure	Q	interrogative
MarkSu	marked subject	R	realis modality
MD	mid deictic	RC	relative clause
MV	medial verb	REAL	realis modality
MV1	first medial verb	REL.CLAUSE	relative clause
MV2	second medial verb	RELF	relative future tense
ND	near deictic	REMP	remote past tense
NEG	negative	S	sentence or clause of headed clause chain structures
NEGP	negative past tense		
NEUT	neutral tense	SA	single argument
NF.DS	non-future different subject	SAdvCLV	adverbial clause follows subject
NONCONT	non-contiguous sequence	SEQ	sequential tense
NONPROG	non-progressive aspect	SG	singular
NOM	nominalised	SIM	simultaneous tense
NONFUT	non-future	SmP	semantic pivot
NP	noun phrase	SP	specifier
NT	neutral topic	splitS	split subject
NUM	number	SR	switch-reference
O2	oblique 2	SS	same subject following
OO	oblique object/benefactive object	ST	same topic
P	past tense	SuAgr	subject agreement
PERS	person (control over referential overlap)	TNGP	Trans-New Guinea Phylum
		TODP	today's past tense
PFCT	perfect aspect	T	topic
PFV	perfective aspect	U	undergoer
PL	plural number	UNSPEC	unspecified for SEQ or SIM
PNG	Papua New Guinea	VP	verb phrase constituent
POS	possessive	YESTP	yesterday's past tense

2 I did the initial research for this article in 1988 on about 100 PNG languages. Later I was encouraged by colleagues, particularly Karl Franklin of S.I.L., to publish this research. For this published version I have expanded the database and added an additional 60+ languages. I have also expanded the scope of the article. An abridged version of this article was presented as a paper at the 1991 Conference of the Linguistic Society of PNG. While I have made every attempt to record the forms and their functions accurately for each language no doubt there will be errors of interpretation on my part and I accept responsibility for this. The article is current up to September 1993, when I submitted the revised WinWord version to *Pacific Linguistics*. During the hiatus between then and the later preparation for publication in June 1995 I have added some recent relevant works of my own and the discussion of recent work on the Trans-New Guinea Phylum hypothesis.

I would like to express my appreciation to David Bevan of S.I.L., who converted the whole manuscript from ASCII format to WinWord format. Tom Dutton of *Pacific Linguistics* was the first to point out the close coincidence of the occurrence of switch-reference in PNG with that of the Trans-New Guinea Phylum and Andy Pawley made some useful suggestions and comments for improving the article.

One problem has been and still is with such a survey is the fact that there are a lot of languages in PNG. The most recent edition of *Ethnologue* (Grimes 1988), for example, lists over 860. Also until recently most of these languages were not written nor described in any way. However, many descriptions of PNG languages have been produced in recent years and in this survey information was available on over 160. Also in many cases one language has been described from a particular family of languages so for the purposes of the survey a good cross-linguistic representation was available. Out of the 169 languages in the survey 122, i.e. 72%, were found to have a SR system and these 122 languages were drawn from and representative of over 50 language families. So although this survey is necessarily preliminary in that we do not have data available on all PNG languages, nevertheless, it is probably representative of SR as it is found in PNG.

The survey covers different aspects of SR in PNG. In §2 the geographical location and dispersion of SR in PNG languages is defined. First it is determined which languages in the survey have SR and which ones do not. Then the geographical dispersion of SR is mapped out. In §3 the formal realisation of SR is charted and discussed. In §4 the grammatical categories that were found to be associated with SR are also charted and discussed. In §5 there is a discussion of the semantic functions of SR with respect to the notions of subject, agent and topic. In §6 there is a discussion of the syntactic functions of SR medial clauses with particular respect to their subordinate and coordinate functions. This question is discussed from both a formal and a functional point of view. In §7 there is a discussion concerning the notion of different systems of SR. In §8 there is some discussion of the origins of SR systems in PNG languages from internal and external sources. In §10 there is a complete listing in alphabetical order of all the languages cited in the survey with an indication of whether the language has a SR system or not, the language family to which the language group belongs, the provincial location in PNG and the sources from which the information was gleaned.

It may be useful at this point to define terms and explain some key concepts. It was Jacobsen who first coined the term 'switch-reference' with the following definition:

> Switch-reference consists simply in the fact that a switch in subject or agent is obligatorily indicated in certain situations by a morpheme, usually suffixed, which may or may not carry other meanings in addition (Jacobsen 1967:240).

Since then this definition has been modified somewhat by various linguists. For example, Haiman and Munro say,

> Canonical switch-reference is an inflectional category of the verb, which indicates whether or not its subject is identical with the subject of some other verb (Haiman and Munro 1983:x).

Haiman and Munro also add,

> Characterisation of 'subject' is strictly syntactic, rather than semantic or pragmatic in most cases: it is not the agent or topic whose identity is being traced (Haiman and Munro 1983:xi).

This agrees with the findings of Austin (1981) that even with a language such as Diyari, which has a split ergative case-marking system, the NP argument that controlled the SR system is the confluence of S/A, i.e. 'subject'. Foley and Van Valin also add,

> There is no categorisation of nouns in switch-reference systems, rather the morphology simply indicates whether the most salient NP in one junct is coreferential or not with the most salient NP of another junct (Foley and Van Valin 1984:339).

So typically SR is verbal inflection which indicates by a simple binary choice whether the subject of the marked verb is coreferential or not with the subject of some other verb.

Various terms have been used in the literature on PNG languages at different times to describe SR. These include "identity" and "non-identity" (Wurm 1964:81), "homopersonal" and "heteropersonal" (Healey 1966:14), "same subject" and "different subject" (Vincent and Vincent 1962:21, Deibler 1963:19, McCarthy 1965:67 and McKaughan 1966:3), "single subject" and "multi-subject" sentences (Kerr 1967:9), "same actor" and "different actor" (Bruce 1984:295), "same referent" and "different referent" (Whitehead 1987) and "anticipatory subject" (Geary 1977:29, Givón 1983). In this article I will mainly use the notation SS/DS to refer to switch-reference (SR) as a coverall term, where SS means 'same subject following' and DS means 'different subject following'.

In PNG many Papuan languages have a particular feature known as clause chaining (from Longacre 1972) whereby many clauses can be linked together. The linking is normally indicated by distinctive verb morphology which differentiates dependent or medial clauses, i.e. those clauses that occur within the chain, from independent or final clauses, i.e. those clauses that occur at the end of the chain. Typically the verbs in final clauses can be inflected for a fuller range of tense and mood categories than the verbs in medial clauses. Indeed in some languages the medial verbs (MV) may not be inflected at all for these categories. Also typically the medial verbs are inflected for SS/DS marking. An example is given as (1), taken from Roberts (1987:238).

(1) *Ija Malolo uqa=na ka jic ana-g ono=nu sum-udi*
1SG Malolo 3SG=of car road mother-3SG.POS there=for wait-3SG.DO(SS)
bi-bil-igin ne-ce-b tobo-co-min bel-ow-an.
DUR-sit-1SG.SIM.DS come.down-DS-3SG climb.up-DS-1SG go-1DU-YESTP
As I waited there (yesterday) on the main road for Malolo's car he came down and I climbed in and off we went. (Amele)

In (1) the medial verbs are marked for SS/DS morphology while the final verb is marked for tense, which happens to be yesterday's past tense in this case. Therefore this tense applies to all the clauses in the clause chain. Another set of terms that will be used in this article is that of marked and controlling clause (Comrie 1983:23). The marked clause is the clause that actually carries the SS/DS marking and the controlling clause is the clause (usually following) which controls the SS/DS marking.

For the purposes of this survey I sometimes had to reword the descriptions. Most commonly this was in instances where the analyst had used an idiosyncratic term for one of the major categories under investigation, such as the variety of terms for SS/DS as given above. In one or two instances I felt it necessary to reanalyse the data. In one case, for example, the original analysts denied that the language under investigation had a SS/DS system when it clearly had. In such cases I have usually indicated that this is a reanalysis. In a number of cases investigators have changed the language name, preferring a name used by the speakers of the language to a name given by outsiders. These cases are indicated and the new name has been adopted in each instance.

2. THE GEOGRAPHICAL DISTRIBUTION OF SS/DS LANGUAGES IN PNG

One purpose of this survey was to determine the geographical distribution of SS/DS marking in PNG languages to see if it follows the same pattern as in other places of occurrence such as in Australia where it occurs in a continuous spread across geographically adjacent but linguistically unrelated languages (see Austin 1981). The basis for the geographical distribution of languages in PNG was taken from language map 5, a map of Papuan language stocks, eastern New Guinea area, from Wurm and Hattori eds (1981). Language groupings with no reports of SS/DS systems are discussed in §2.1 and language groupings with reports of SS/DS systems are discussed in §2.2.

2.1 LANGUAGE GROUPINGS WITH NO REPORTS OF A SS/DS SYSTEM

I will discuss first the language groupings with no reports of SS/DS systems found in the Western and Gulf Provinces. These include the Marind stock, the Gogodala-Suki stock, the Trans-Fly stock, the Pawaian language, a stock-level isolate, the Turama-Kikorian family, the Inland Gulf family, and the Eleman family.

2.1.1 MARIND STOCK

The Marind languages that occur around Lake Murray include Boazi, Kuini, Begua and Zimakani (Voorhoeve 1970a). According to Drabbe (1955) and Boelaars (1950) the Marind languages do not have clause chaining structures with SS/DS marking. Foley, in his discussion of clause chaining in Papuan languages (Foley 1986:175-198), comments that while systems of clause chaining, with the accompanying features of dependent versus independent clauses and SS/DS systems, are representative of Papuan languages this feature is by no means universal. In particular the Marind and Kiwai languages of the south central coast of PNG do not exhibit clause chaining. Instead sentences are formed by linking fully inflected verbs in a coordinate structure, as in (2), for example. The meaning of the undefined abbreviation is FUT(ure tense).

(2) *Ndam-o-ka-kiparud jah ma-n-man.*
FUT-2SG-first-tie and.then FUT-1SG-come
You tie first and then I will come. (Marind)

2.1.2 GOGODALA-SUKI STOCK

The Gogodala and Suki language groups are located on either side of the Fly river. From Voorhoeve (1970b:1245-1270) it would appear that these languages are structurally similar to the Marind languages and lack clause chaining with SS/DS marking.

2.1.3 TRANS-FLY STOCK

The languages of the Trans-Fly stock (Wurm 1975b) occur along the coast of the Western and Gulf Provinces from the Irian Jaya and PNG border to the mouth of the Kikori river in the Gulf Province. The best known languages from this group are the Kiwai ones. According to Ray (1933) and Foley (1986) (see above) the Kiwai languages do not have clause chaining structures with SS/DS marking. Fleischmann and Turpeinen (1975) give a

grammatical description of the Bine language which belongs to the Eastern-Trans Fly family and is spoken near to Daru. According to this description Bine also lacks SS/DS morphology.

2.1.4 PAWAIAN STOCK-LEVEL ISOLATE

The Pawaian language is located inland around the Purari river. In his comparative study of Kuman and Pawaian Trefry (1969:64) states that, while Kuman has a SS/DS system marked on its medial verbs, Pawaian has no such system of marking.

2.1.5 TURAMA-KIKORIAN SUB-PHYLUM-LEVEL FAMILY

The Turama-Kikorian languages occur inland between the Turama and Kikori rivers. Franklin (1973:265-268) briefly discusses the genetic relationships of these languages but gives no information on the verb morphology. Wurm (1975c:508), however, from field notes by Capell on Kairi, a family-level isolate of the Turuma-Kikorian stock says that this language does appear to distinguish between medial and final verbs with SS marked by ∅. However, Petterson (1986) describes the grammar of Rumu, the Kikori Kairi language of the Turama-Kikorian sub-phylum, and shows that while this language has medial verb forms that distinguish the categories SEQ(uential) and SIM(ultaneous) tense there is no SS/DS marking on the medial verb. So probably this language family does not have SS/DS.

2.1.6 ELEMAN SUB-PHYLUM-LEVEL FAMILY

The languages of the Eleman family are spoken along the Gulf coast from east of the Kikori river to the boundary of the Gulf Province. According to Brown (1973:279-376) the Eleman languages Toaripi, Opao (Sepoe) and Orokolo do not possess SS/DS verb morphology. It would appear that SS/DS systems do not occur in these languages.

The next geographical area to discuss is the West and East Sepik Provinces located on the northern coast of PNG beginning at the Irian Jaya border. In these provinces the situation is more complex and less clear. In the West Sepik there are a group of unclassified isolate languages for which there is no information available as to whether they have SS/DS systems or not. These are the Biksi, Busa, Nagatman, Amto and Musian languages (see Laycock 1973:69). Similarly there are no descriptions available of the Leonard Schultze languages located around the Leonard Schultze river. For other Sepik languages, however, there is more information available. The language groups discussed below include the Border, Yellow River, Upper Sepik, Ram, Tama, Sko, Kwomtari, Arai (Left May), Torricelli, Nor-Pondo (or Lower Sepik), and Ramu language groupings.

2.1.7 BORDER STOCK

With the Border Stock languages the picture is clearer. Grammatical descriptions are available for several of the Waris family of languages, for example Brown (1981, 1988, 1990) on Waris, Seiler (1985) on Imonda and Minch (1992) on Amanab. From these descriptions it is clear that these languages do not have SS/DS systems.

2.1.8 YELLOW RIVER STOCK-LEVEL FAMILY

A description of Namie, the largest of the Yellow River language family, by Feldpausch and Feldpausch (1992) shows that this language does not have a SS/DS system. It is yet to be determined whether the other two languages of this language family, Ak and Awun, also lack SS/DS systems.

2.1.9 UPPER SEPIK STOCK

The Upper Sepik stock includes the Iwam, Abau and Wogamusin language families. From the descriptions available on the Iwam language by Conrad (1965) and Laszlo, Conrad and Hunney (1981) it would appear that this language lacks a SS/DS system. Similarly the description of Abau by Lock and Lock (1986) shows that this language lacks a SS/DS system. There is no description available for the Wogamusin language family, however.

2.1.10 RAM STOCK-LEVEL FAMILY

A full description of the Awtuw language (Ram family) by Feldman (1986) shows that this language lacks a SS/DS system. However, there is no information available on the other languages of this family, Bouye and Karawa.

2.1.11 TAMA STOCK-LEVEL FAMILY

A full description of the Yessan-Mayo language (Tama family) by Foreman (1974) shows that this language does not have a SS/DS system. However, there is no information available on the other languages of this family, Pasi, Pahi, Mehek and Kalou.

Since all the descriptions available of languages belonging to the Upper Sepik super-stock show that these languages do not have SS/DS systems it may be the case that all the Upper Sepik super-stock languages lack SS/DS systems.

2.1.12 SKO PHYLUM-LEVEL STOCK

From the small amount of descriptive data available on the Sko languages in Voorhoeve (1971) on Sko and Ross (1980) on Vanimo it would seem to be the case that these languages do not have SS/DS systems.

2.1.13 KWOMTARI PHYLUM-LEVEL STOCK

From the field notes of Baron (1987) it is clear that the Fas language does not have a SS/DS system. However, in Hamlin and Hamlin's (Hamlin and Hamlin 1989) grammar of Nai (Biaka), a language of the Kwomtari stock, Baibai family, they describe the SS/DS system in this language.

2.1.14 ARAI (OR LEFT MAY) PHYLUM-LEVEL FAMILY

Laycock (1973) describes the Left May family as comprising seven languages: Waniabu, Bero, Yinibu, Nakwi, Namo-Wasuai, Po and Iyo. However, Årsjö and Årsjö (1975) rename this group of languages the Arai family and reclassify it into six languages: Ama, Rocky Peak, Bo, Iteri, Nimo and Owiniga. According to their grammar of Ama (Årsjö and Årsjö 1975) this language does not have a SS/DS system.

2.1.15 TORRICELLI PHYLUM

The Torricelli languages are a large grouping of languages spoken in and around the Torricelli mountains on the north coast of the West Sepik Province, around Angoram in the East Sepik Province and around Bogia in Madang Province. They share a number of unusual typological features for Papuan languages which Foley (1986:241) outlines as: SVO word-order, complex noun-class systems with phonological shape being a determining factor, unusual pronoun prefixes to the verb, simple morphological structure for verbs, and irregular plurals for nouns. They also have a shared grammatical feature of not possessing SS/DS systems. Grammatical descriptions of Torricelli languages include: McGregor and McGregor (1982) of Olo, Scorza (1974, 1985) of Au, Schmidt and Vormann (1900), Spölgen and Schmidt (1901), and Klaffl and Vormann (1905) of Valman, Fortune (1942), Gerstner (1963) and Conrad and Wogiga (1991) of Mt. Arapesh, Alungun et al. (1978) of Southern Arapesh, Sanders (1978) of Kamasau, and Vormann and Scharfenberger (1914) of Monumbo.

2.1.16 NOR-PONDO (OR LOWER SEPIK) SUB-PHYLUM-LEVEL STOCK

Grammatical descriptions of Murik by Schmidt (1953), Abbott (1978), Abbott and Abbott (1978) and of Yimas by Foley (1991) show that the Nor-Pondo languages spoken along the lower stretches of the Sepik river do not have SS/DS systems.

Finally, there are some Papuan languages located off the mainland of PNG which do not have SS/DS systems. These are classified as belonging to the East Papuan Phylum (Franklin, ed. 1973) and comprise the Yele-Solomons stock and New Britain stock.

2.1.17 YELE-SOLOMONS STOCK

Grammatical descriptions of Yele, spoken on Rossel Island off the southeast coast of PNG, by Henderson (1975) and Henderson and Henderson (1979) show that this language does not have a SS/DS system.

2.1.18 NEW BRITAIN STOCK

Grammatical descriptions of the stock level isolate languages Kol (Lindrud 1982) and Ata (Hashimoto 1991), spoken on East New Britain, show that these languages do not have a SS/DS system. Kol is SVO word order and has typological features similar to the Torricelli languages.

2.2 LANGUAGE GROUPINGS WITH REPORTS OF A SS/DS SYSTEM

The language families where languages are reported to have SS/DS systems (see Appendix 3 for sources) include the following listed geographically according to province from west to east across PNG: Ok (Western), East Strickland (Southern Highlands), Inland Gulf (Western), West Kutuban (Southern Highlands), Teberan (Gulf), Yuri (West Sepik), Senagi (West Sepik), Baibai (West Sepik), Nukuma (East Sepik), Ndu (East Sepik), Sepik Hills (East Sepik), Oksapmin (East Sepik), Grass (East Sepik), Engan (Enga), Chimbu (Chimbu), Gorokan (Eastern Highlands), Kainantu (Eastern Highlands), Piawi (Madang), Banaro (Madang), Atan (Madang), Emuan (Madang), Kalam (Madang), Kumilan (Madang), Numugenan (Madang), Kowan (Madang), Bargam (Madang), Hanseman (Madang), Gum (Madang), Kokon (Madang), Belan (Austronesian, Madang), Mindjim (Madang), Nuru (Madang), Kabenau (Madang), Evapia (Madang), Brahman (Madang), Gusap-Mot (Madang–Morobe), Yupna (Madang–Morobe), West Huon (Morobe), East Huon (Morobe), Wantoat (Morobe), Erap (Morobe), Kovai (Morobe), Uruwa (Morobe), Binandarean (Oro), Angan (Gulf–Morobe), Goilalan (Central, Morobe, Oro), Koiarian (Central, Oro), Dagan (Central), Yareban (Central), Rotokas (Bougainville) and South Bougainville (North Solomons) language families. 51 language families were found to definitely have SS/DS systems. In addition, SS/DS systems occur in all of the languages of the Ramu sub-phylum (Madang–East Sepik) for which we have a description.

There are no descriptions available for some of the language groupings in Madang Province, such as the Josephstaal stock. Madang Province on the north coast of PNG is probably the most complex linguistic scene in the world for numbers of different languages and genetic diversity. There are about 174 languages comprising almost 50 families of Papuan, Austronesian and Torricelli languages in an area of approximately 5400 square kilometres. Many of these languages have yet to be described but every Papuan language investigated so far in Madang Province has an SS/DS system. In view of this I am assuming that these undescribed language groupings in Madang Province also have SS/DS.

All of this information is detailed below.

2.2.1 OK FAMILY

In the Ok family SS/DS is reported to occur in the Telefol, Mianmin and Tifal languages and reported not to occur in the Faiwol language. For the Wagarabai, Setaman, Kauwol, Bimin, and Ngalum languages there is no information available as to whether they have SS/DS or not.

2.2.2 EAST STRICKLAND FAMILY

In the East Strickland family SS/DS is reported to occur in the Samo language. For the Kubo, Bibo, Honibo, and Tomu languages there is no information available as to whether they have SS/DS or not.

2.2.3 INLAND GULF SUB-PHYLUM-LEVEL FAMILY

The Inland Gulf languages are located inland around the Wawoi River. Franklin (1973:269-272), and Franklin and Voorhoeve (1973:149-186) briefly discuss the genetic relationships of these languages but there is no information available on the verb morphology. However, Routamaa (1993) describes the Kamula language as having a SS/DS system. This language belongs to the Inland Gulf grouping of languages but Routamaa suggests, on the basis of a lexical comparison with the neighbouring languages, that Kamula be classified as a family-level isolate.

2.2.4 WEST KUTUBAN FAMILY

In the West Kutuban family SS/DS occurs in the Fasu language, although it is not described as such by Loeweke and May (1980). In fact, Loeweke and May deny that Fasu has SS/DS marked on the dependent verb:

> There is no 'different subject' or 'same subject' suffix on verbs of the preceding clause to indicate that what follows does not involve the speaker (Loeweke and May 1980:63).

However, what Loeweke and May (1980:54) term "speaker viewpoint" suffixes for the dependent verbs clearly form two sets of SS and DS markers on the basis of the data they present, as illustrated in Table 1.

TABLE 1: FASU SS/DS MARKERS

SS		DS	
-ka	sequence	*-(ho)ane*	sequence
-raka	consecutive	*-rakano*	consecutive
		-rakasapo	immediate past
		-rakasupo	past
-pe	simultaneous	*-mo*	simultaneous
		-sekeno	simultaneous
-ako	purpose	*-hoasimo*	purpose
-paka	negative purpose/lest	*-akohoamo*	negative purpose/lest

In fact, from the data presented it is almost possible to analyse the SS marker as *-ka≈-ko* and the DS marker as *-ne≈-no≈-mo≈-po*. For the Some and Namuni languages there is no information available as to whether they have SS/DS or not.

2.2.5 TEBERAN FAMILY

In the Teberan family (see MacDonald 1973) SS/DS is reported to occur in the Podopa language and reported not to occur in the Dadibi language. Dadibi is interesting in that while it has dependent medial verbs with categories marked that are normally associated with a SS/DS system, such as SEQ versus SIM relative tense, the crucial SS versus DS distinction is not marked in any way.

2.2.6 YURI FAMILY ISOLATE

The Karkar-Yuri language is one of the unclassified group of language isolates located near to the Irian Jaya-PNG border in West Sepik Province and is reported to have a SS/DS system.

2.2.7 SENAGI FAMILY

In the Senagi family SS/DS is reported to occur in the Anggor language. For the Dera and Duka-Ekor languages there is no information available as to whether they have SS/DS or not.

2.2.8 BAIBAI FAMILY

In the Baibai family SS/DS is reported to occur in the Nai language. For the Baibai language there is no information available as to whether it has SS/DS or not.

2.2.9 NUKUMA FAMILY

In the Nukuma family SS/DS is reported to occur in both the Washkuk (Kwoma) and Kwanga languages.

2.2.10 NDU FAMILY

In the Ndu family (from Laycock 1965) SS/DS is reported to occur in the Ambulas (Abelam), Boiken and Iatmul languages. With Iatmul the SS versus DS distinction is not indicated overtly but the medial verb that can only be used with SS following has forms that indicate a variety of semantic relationships with the following verb. These forms with their meanings are displayed in Table 2.

TABLE 2: IATMUL SS MARKERS

-laa	sequential
-yəkiy-laa	sequential - object totally affected
-lampi-laa	sequential - object partially affected
-ləviy-laa	sequential - object unaffected
-simpla-laa	simultaneous - causal completed
-simpla	simultaneous - causal uncompleted
-kiva	non-causal

For the Manambu, Sawos, Buiamanambu, Yelogu, and Ngala languages there is no information available as to whether they have SS/DS or not.

2.2.11 SEPIK HILLS FAMILY

In the Sepik Hills family SS/DS is reported to occur only in the Alamblak language. It is reported not to occur in the Bahinemo, Sanio and Hewa languages. This would suggest that SS/DS is peculiar to Alamblak in this language family. For the Kaningra, Kapriman, Watakataui, Sumariup, Bisis, Mari, Bitara, Setiali, Paka, Gabiano, Piame, and Bikaru languages there is no information available as to whether they have SS/DS or not.

2.2.12 OKSAPMIN FAMILY ISOLATE

The Oksapmin language isolate is reported to have a SS/DS system.

2.2.13 GRASS FAMILY

In the Grass family SS/DS is reported to occur in the Botin (Kambot) language. For the Gorovu, Adjora, and Aion languages there is no information available as to whether they have SS/DS or not.

2.2.14 ENGAN FAMILY

In the Engan family SS/DS is reported to occur in the Enga and Kewa languages. For the Mendi, Ipili, Bisorio, Sau, and Huli languages there is no information available as to whether they have SS/DS or not.

2.2.15 CHIMBU FAMILY

In the Chimbu family SS/DS is reported to occur in the Kuman, Salt-Yui, Chuave, Wahgi, Nii, Maring, Medlpa, Kaugel (Gawigl) and Kandawo languages and reported not to occur in the Golin and Sinasina languages. With Golin, in Longacre (1972) various forms of 'anomalous' SS/DS marking are discussed for Golin but later in his grammar of Golin Bunn (Bunn 1974) demonstrates that what were considered to be SS versus DS markers in Longacre (1972) are actually SEQ versus SIM instead and there is no way of marking SS versus DS in Golin. According to McVinney and Luzbetak (1954) Sinasina has no system of SS/DS marking although, similar to Golin, there is a distinction marked on the dependent medial verb of SEQ versus SIM. For the Dom, Nagane and Narak languages there is no information available as to whether they have SS/DS or not.

2.2.16 GOROKAN FAMILY

In the Gorokan family SS/DS is reported to occur in the Gende, Siane, Gahuku, Benabena, Kamano, Kanite, Yagaria, Hua, Fore, and Gimi languages. For the Yabiyufa and Asaro languages there is no information available as to whether they have SS/DS or not. Strange (1973) does not mention whether there is SS/DS marking or not.

2.2.17 KAINANTU FAMILY

In the Kainantu family SS/DS is reported to occur in the Gadsup, Agarabi, Usarufa, Kosena, Tairora, Awa, and Waffa languages. For Binumarian it is probably the case that this language has SS/DS but it is unclear from Oatridge and Oatridge (1966) how it is marked. For the Owena language there is no information available as to whether it has SS/DS or not.

2.2.18 PIAWI (WUAIBUK) FAMILY

Comrie (1988, 1989), in a survey of the Haruai language, Piawi stock-level family reports that this language has a SS/DS system but gives no details. There is no information available on the other languages of this family; Aramo (or Aramaue), Pinai (or Pinaye) and Wapi.

2.2.19 BANARO FAMILY ISOLATE

The Banaro language isolate is reported to have a SS/DS system.

2.2.20 ATAN FAMILY

In the Atan family SS/DS is reported to occur in the Nend (Angaua) language. For the Atemple language there is no information available as to whether it has SS/DS or not.

2.2.21 EMUAN FAMILY

In the Emuan family SS/DS is reported to occur in the Apali (Emerum) language. For the Musak language there is no information available as to whether it has SS/DS or not.

2.2.22 KALAM FAMILY

In the Kalam family SS/DS is reported to occur in the Kalam and Kobon languages. According to recent comparative research by Pawley (1995) the Gants language should be assigned to the Emuan language family. However, I do not have information available as to whether it has SS/DS or not.

2.2.23 KUMILAN FAMILY

In the Kumilan family SS/DS is reported to occur in the Mauwake (Ulingan) language. For the Bepour and Moere languages there is no information available as to whether they have SS/DS or not.

2.2.24 NUMUGENAN FAMILY

In the Numugenan family SS/DS is reported to occur in the Usan (Wanuma) language. For the Yaben, Yarawata, Bilakura, Parawen, and Ukuriguma languages there is no information available as to whether they have SS/DS or not.

2.2.25 KOWAN FAMILY

In the Kowan family SS/DS is reported to occur in the Waskia language. For the Korak language there is no information available as to whether it has SS/DS or not.

2.2.26 BARGAM FAMILY ISOLATE

The Bargam language isolate is reported to have a SS/DS system.

2.2.27 HANSEMAN FAMILY

In the Hanseman family SS/DS is reported to occur in the Nobonob (Garuh) language. For the Rapting, Wamas, Samosa, Murupi, Saruga, Nake, Mosimo, Garus, Yoidik, Rempi, Bagupi, Silopi, Utu, Mewan, Baimak, Matepi, Gal, and Kamba languages there is no information available as to whether they have SS/DS or not.

2.2.28 GUM FAMILY

In the Gum family SS/DS is reported to occur in the Amele language. According to my own field research all the other languages of the Gum family, i.e. the Sihan, Gumalu, Isebe, Bau, and Panim languages, have a medial verb system with the SS/DS distinction marked morphologically on the verb.

2.2.29 KOKON FAMILY

In the Kokon family SS/DS is reported to occur in the Girawa language. For the Munit and Bemal languages there is no information available as to whether they have SS/DS or not.

2.2.30 BELAN (AUSTRONESIAN) FAMILY

Contrary to previous reports that SS/DS does not occur in Austronesian languages in PNG, the Dami (Ham) language, which is an Austronesian language of the Belan sub-family in Madang, is reported to have a SS/DS system (Elliot 1990). A possible source for its origin is suggested in §3.

2.2.31 MINDJIM FAMILY

In the Mindjim family SS/DS is reported to occur in the Anjam (Bom) language. For the Male, Bongu, and Songum languages there is no information available as to whether they have SS/DS or not.

2.2.32 NURU FAMILY

In the Nuru family SS/DS is reported to occur in the Erima language. For the Usu, Duduela, Kwato, Rerau, Jilim, and Yangulam languages there is no information available as to whether they have SS/DS or not.

2.2.33 KABENAU FAMILY

In the Kabenau family SS/DS is reported to occur in the Siroi language. For the Arawum, Kolom, Lemio, and Pulabu languages there is no information available as to whether they have SS/DS or not.

2.2.34 EVAPIA FAMILY

In the Evapia family SS/DS is reported to occur in the Koromu (Kesawai) language. For the Sinsauru, Asas, Sausi, and Dumpu languages there is no information available as to whether they have SS/DS or not.

2.2.35 BRAHMAN FAMILY

In the Brahman family SS/DS is reported to occur in the Tauya language. For the Isabi, Biyom, and Faita languages there is no information available as to whether they have SS/DS or not.

2.2.36 GUSAP-MOT FAMILY

In the Gusap-Mot family SS/DS is reported to occur in the Rawa language. For the Ngaing, Naru, Gira, Neko, and Nekgini languages there is no information available as to whether they have SS/DS or not.

2.2.37 YUPNA FAMILY

In the Yupna family SS/DS is reported to occur in the Yupna (Kewieng) and Nankina languages. For the Gabutamon, Domung, Bonkiman, Wandabong, Isan, Nokopo, and Mebu languages there is no information available as to whether they have SS/DS or not.

2.2.38 WEST HUON FAMILY

In the West Huon family SS/DS is reported to occur in the Burum, Komba, Nabak, Ono, Selepet and Timbe languages. For the Sialum, Nomu, Kinalakna, Kumukio, Tobo, Yaknge, Kosorong, and Momolili languages there is no information available as to whether they have SS/DS or not.

2.2.39 EAST HUON FAMILY

In the East Huon family SS/DS is reported to occur in the Kâte, Kube and Dedua languages. For the Mape, Sene, Momave, and Migabac languages there is no information available as to whether they have SS/DS or not.

2.2.40 WANTOAT FAMILY

In the Wantoat family SS/DS is reported to occur in the Wantoat and Irumu languages. For the Awara, Leron, Saseng, Bam, and Yagawak languages there is no information available as to whether they have SS/DS or not.

2.2.41 ERAP FAMILY

In the Erap family SS/DS is reported to occur in the Uri and Nek languages. For the Mamaa, Finungwan, Gusan, Nimi, Sauk, Numanggang, Nakama, Nuk, and Munkip languages there is no information available as to whether they have SS/DS or not.

2.2.42 KOVAI FAMILY ISOLATE

The Kovai language isolate is reported to have a SS/DS system.

2.2.43 URUWA FAMILY

The Uruwa family is classified as comprising the Komutu, Kumdauron, Worin, Mitmit, Mup, Sindamon, Sakam and Som languages by McElhanon (1967, 1973). However Lauver and Wegmann (1990) reclassify this language family as comprising the Komutu, Sakam, Som, Weliki and Yau languages. Lauver and Wegmann (1990) also describe the SS/DS system that occurs in Yau. For the Komutu, Sakam, Som, and Weliki languages, however, there is no information available as to whether they have SS/DS or not.

2.2.44 BINANDAREAN FAMILY

In the Binandarean family SS/DS is reported to occur in the Suena, Zia, Orokaiva, Korafe, Binandere and Guhu-Samane (Mid-Waria) languages. For the Yekora, Ambasi, Aeka, Hunjara, Notu, Yega, Gaina, Baruga and Dogoro languages there is no information available as to whether they have SS/DS or not.

2.2.45 ANGAN FAMILY

In the Angan family (Lloyd 1973) SS/DS is reported to occur in the Baruya, Wojokeso (Ampale), Angave, Menya, Kapau, Angaataha, Akoye (Lohiki) and Tainae (Kukukuku) languages. For the Simbari, Kawacha, Kamasa, Yogwoia and Ivori languages there is no information available as to whether they have SS/DS or not. However, one feature of all the Angan languages described so far is a very complex verb morphology which always

includes the SS/DS distinction. So it would be likely that all the languages of this family have an SS/DS system.

2.2.46 GOILALAN FAMILY

In the Goilalan family SS/DS is reported to occur in the Weri, Kunimaipa and Tauade languages and reported not to occur in the Biangai language. For the survey I could not obtain access to Ray (1912) to see if Fuyuge had SS/DS or not.

2.2.47 KOIARIAN FAMILY

In the Koiarian family SS/DS is reported to occur in all the languages of this family, namely the Koiari, Koita, Mt. Koiali, Barai, Ömie and Managalasi languages.

2.2.48 DAGAN FAMILY

In the Dagan family SS/DS is reported to occur in the Daga and Kanasi languages. For the Mapena, Gwedena, Ginuman, Sona, Jimajima, Maiwa, and Onjob languages there is no information available as to whether they have SS/DS or not.

2.2.49 YAREBAN FAMILY

In the Yareban family SS/DS is reported to occur in the Yareba language. For the Abia, Doriri, and Bariji languages there is no information available as to whether they have SS/DS or not.

2.2.50 ROTOKAS FAMILY

In the Rotokas family SS/DS is reported to occur in the Rotokas language. For the Eivo language there is no information available as to whether it has SS/DS or not.

2.2.51 SOUTH BOUGAINVILLE FAMILY

In the South Bougainville family SS/DS is reported to occur in the Nasioi, Nagovisi and Buin languages. For the Siwai language there is no information available as to whether it has SS/DS or not.

2.2.52 RAMU SUB-PHYLUM

There is very little known about the grammatical structure of the languages of the Ramu sub-phylum which are spoken on the border of the East Sepik and Madang Provinces (see Laycock and Z'graggen 1975). This includes the following language groupings: Mongol-Langam stock-level family, Yuat stock, Waibuk (Piawi) stock-level family, Grass stock, Arafundi stock-level family, Annaberg stock, Ruboni stock, and Goam stock. However, recent descriptions of Botin (called Kambot by Laycock 1973:38), a Grass family language, by Pryor and Farr (1989) and Pryor (1990) shows that this language has a simple SS/DS

system. Also reports from researchers working in the Giri language of the Ruboni stock and the Tangu language of the Goam stock say that SS/DS occurs in these languages also. Comrie (1988, 1989) also reports, in a survey of the Haruai language, Piawi stock-level family, that this language has a SS/DS system but gives no details. On the basis of this evidence it may well be the case that SS/DS is a feature of the Ramu languages.

2.2.53 JOSEPHSTAAL STOCK

The Josephstaal stock comprises four language families, Sikan, Osum, Pondomaikan and Wadaginam (see Z'graggen 1975) located around Josephstaal in central Madang Province. There are no grammatical descriptions available for any of the Josephstaal Stock languages that would show whether these languages have SS/DS systems or not. However, since they are surrounded by languages that possess SS/DS systems it is likely that they have them too.

2.2.54 MISCELLANEOUS MADANG LANGUAGE FAMILIES

For a miscellaneous number of Papuan language families in Madang Province we have no information as to whether the languages of these families have SS/DS or not. These are: Yaganon, Peka, Kare, Dimir, Mabuan, Kaukombaran, Tiboran, Omosan, Amaimon, Paynamar and Warup.

2.3 MAPPING SS/DS IN PNG

The information about occurrence and non-occurrence of SS/DS is transferred to the map. This shows geographically the location of language families where SS/DS is known to occur, +SS/DS, the location of language families where SS/DS is known not to occur, –SS/DS, and the location of language groupings where we do not know if SS/DS occurs or not ?SS/DS. The map also shows the location of the Austronesian language groups and the uninhabited areas of PNG. In most cases the fact that one or several languages from a particular language family have SS/DS is probably representative of the whole language family. For some language families, however, we know that this is not the case. For example, Alamblak may well be the only language in the Sepik Hills family that has SS/DS. In the Teberan family one language, Podopa, has SS/DS while another language, Dadibi, does not and for the Tebera language itself we have no information. For other language families we know that while the majority of languages in the group have SS/DS one or two do not. This is the case, for example, with the Ok, Chimbu and Goilalan families. Nevertheless, the map does give a fairly accurate representation of the geographical dispersion of SS/DS in PNG languages.

What the map shows is that SS/DS in PNG basically occurs in the mountainous highland areas starting from the Star Mountains in the west and running all the way down the central mountain chain as far as the eastern end of the Stanley Range. On the mainland SS/DS also spreads into the Huon peninsula, into Madang Province and in the Sepik there is a phalanx of SS/DS running from the Central Range to Wewak on the coast. All of these areas of SS/DS occurrence are contiguous. The only areas where SS/DS occurs non-contiguous to the main body on the mainland is in the Senagi family and in the Karkar-Yuri language isolate in the West Sepik. When the location of SS/DS in Irian Jaya is taken into account it may turn out that these language groups are contiguous to the main body but this survey deals only with

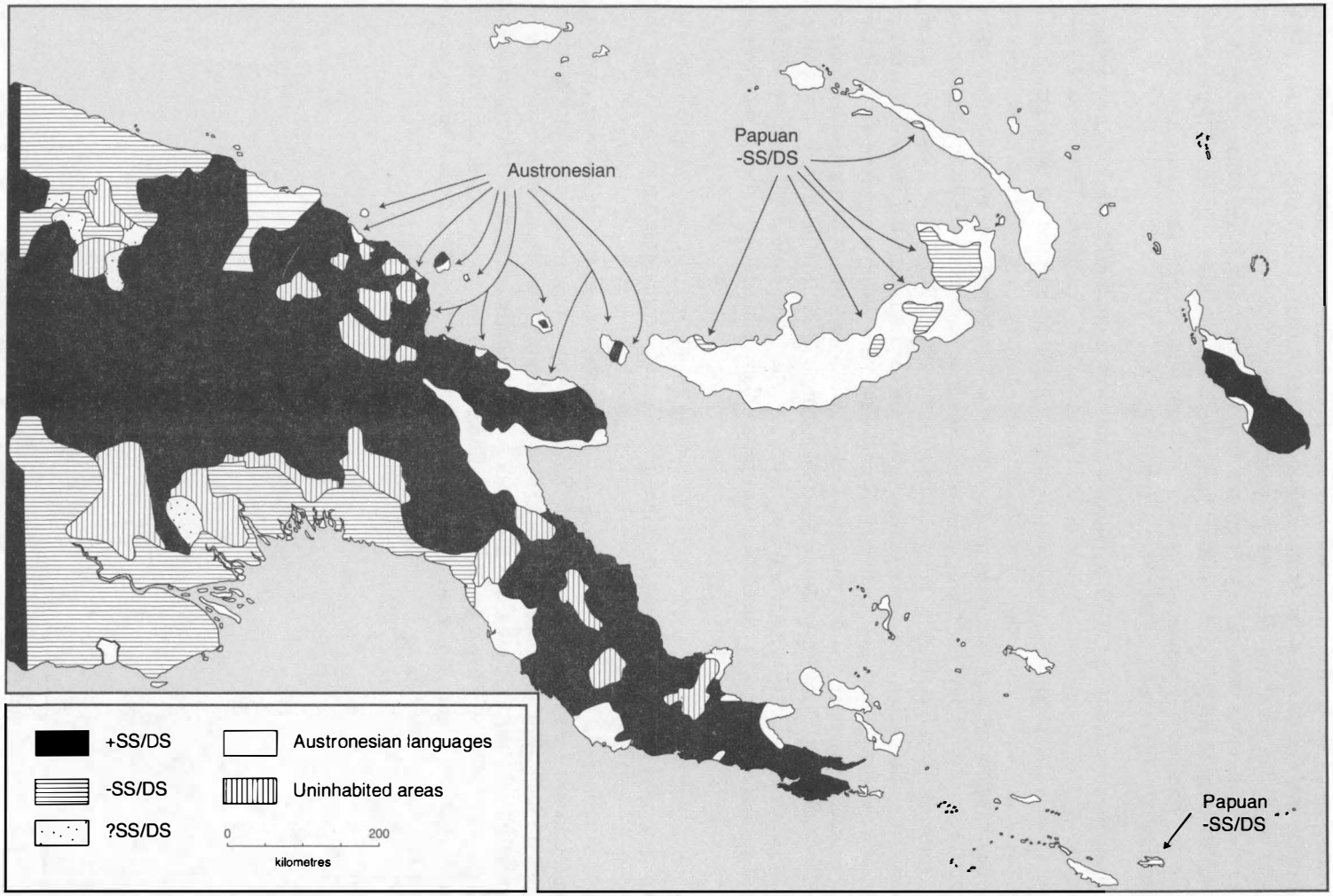
the geographical location of languages in PNG. The other area where SS/DS occurs which is completely separate from SS/DS on the mainland is on Bougainville Island.

SS/DS in PNG shows the same pattern of geographical dispersion across languages as in Australian and North American Indian languages (see Austin (1981) and Jacobsen (1983) respectively). The same morphosyntactic phenomenon of SS/DS marking is dispersed over an almost continuous area across languages that are genetically widely diverse. In those locations SS/DS is judged to be an areal phenomenon rather than a genetic phenomenon. However, whether this applies to SS/DS in PNG depends on how the Trans-New Guinea Phylum (TNGP) hypothesis is taken into account.

In its maximal form, the TNGP hypothesis holds that some 500 of the 750 or so Papuan language of PNG are genetically related at a deep level.[3] The name Trans-New Guinea Phylum was first applied to a more restricted grouping posited in McElhanon and Voorhoeve (1970). In the period 1966-68, these two linguists had gathered lexical data on languages located in different parts of New Guinea. Voorhoeve had worked in languages located west of the Trans-Fly region in what is now Irian Jaya and McElhanon had worked in languages located on the Huon Peninsula of PNG. Voorhoeve observed strong resemblances in lexicon between a number of established families and languages and this led him to posit a Central and South New Guinea Phylum (CSNGP) comprising five families plus isolated languages (Voorhoeve 1968). Following his own research, McElhanon in collaboration with Claassen (Claassen and McElhanon 1970, McElhanon 1970a) posited the Finisterre-Huon Phylum (FHP). When Voorhoeve compared notes with McElhanon they found a small but impressive body of lexical resemblances indicating a distant relationship between the CSNGP and the FHP.

Over the next few years other groups of New Guinea languages were added to the core TNGP group. These included the Binandere group, of the Northern Province of Papua, the Nimboran-Sentani group, spoken around Lake Sentani in Irian Jaya. Z'graggen (1971, 1975, 1980a-d) proposed adding the Rai Coast and Adelbert Range groups in Madang Province. Later Wurm (1975) argued for including the East New Guinea Highlands Stock, which occupied much of the land between the CSNGP and the FHP, and most of the languages of the southeastern part of New Guinea, as well as some languages spoken in the northwest. Voorhoeve (1975a,b) also proposed a connection between the non-Austronesian languages of the islands of Timor, Alor and Pantar and the TNGP. This greatly expanded version of the TNGP is given in Table 3.

3 Most of this account of the history of the TNGP hypothesis is based on Pawley (1995).



MAP: DISTRIBUTION OF TYPES OF SWITCH-REFERENCE SYSTEMS IN PAPUA NEW GUINEA

TABLE 3: THE TRANS-NEW GUINEA PHYLUM (1975)

1	Finisterre Huon Stock	25	Brahman stock-level Family
2	East New Guinea Highlands Stock	26	Teberan stock-level Family
3	Kutubuan Stock	27	Pawaian stock-level Isolate
4	Central and South New Guinea Stock	28	Turama-Kikorian subphylum-level Stock
5	Angan stock-level Family	29	Inland Gulf subphylum-level Family
6	Gogodala-Suki Stock	30	Eleman subphylum-level Stock
7	Marind Stock	31	Trans-Fly Stock
8	Kayagar stock-level Family	32	Yelmek-Maklew (or Bulaka River) stock-level Family
9	Sentani Stock	33	Mek (or Goliath) subphylum-level Family
10	Dani-Kwerba Stock	34	Oksapmin subphylum-level Isolate
11	Dem stock-level Isolate	35	Senagi subphylum-level Family
12	Wissel Lakes-Kemandoga Stock	36	Pauwasi subphylum-level Stock
13	Mairasi-Tanah Merah Stock	37	Border Stock
14	West Bomberai Stock	38	Tor-Lake Plain Stock
15	Mor stock-level Isolate	39	Morwap subphylum-level Isolate
16	Binandere Stock	40	Molof subphylum-level Isolate
17	Central and South-Eastern Stock	41	Usku subphylum-level Isolate
18	Rai Coast Stock	42	Tofamna subphylum-level Isolate
19	Mabuso Stock	43	Nimboran subphylum-level Family
20	Mugil stock-level Isolate	44	Kaure subphylum-level Stock
21	Isumrud Stock	45	Kolopom (or Frederik Hendrik Island) subphylum-level Family
22	Pihom Stock		
23	Josephstaal Stock	46	South Bird's Head (or South Vogelkop) Stock
24	Wanang Stock	47	Timor-Alor-Pantar Stock

However, a number of other linguists, such as R. Lang (1976), Haiman (1979, 1991), Heeschen (1978) and Foley (1986), researching Papuan languages have been largely unconvinced of the validity of the TNGP hypothesis as proposed in Wurm, Voorhoeve and McElhanon (1975). Their main objections were that the deep genetic relationships were based largely on speculation and that valid sound change correspondences had not been established. Foley (1986) also argued that because structural features and basic vocabulary are readily borrowed in the sociolinguistic conditions in New Guinea deep genetic relations between established groups will rest on cognate morphology rather than lexical forms. Haiman and Foley suggested that before speculating on such a large genetic grouping like the TNGP more research was needed in establishing the genetic relationships of the smaller language groups.

This has been the status of the TNGP hypothesis up until the 1990s. However, a recent collaborative project between the Australian National University and the University of Sydney aiming at descriptive and comparative work on Papuan languages has yielded some promising results in reestablishing the validity of the TNGP hypothesis. This project has focussed initially on some 90 languages of Madang Province which clearly form a genetic group. Pawley (1995) gives a selection of lexical comparisons which shows that regular sound correspondences can be discerned between pairs of remotely related Papuan languages, i.e. languages that share fewer than five percent of cognates in basic vocabulary.

If we assume that the TNGP hypothesis is valid then we have quite a close match between the dispersion of SS/DS in PNG and the TNGP. This would have a bearing on whether we consider SS/DS in PNG an areal phenomenon, as it appears to be elsewhere in the world, or a genetic phenomenon. The problem is that there are some significant discrepancies in the match.

There are some PNG language stocks purportedly within the TNGP which do not have SS/DS, namely the Gogodala-Suki, Marind, Trans-Fly and Border stocks, and the Turama-Kikorian, Eleman and Pawaian subphylum-level stocks and families. All of these language groupings, apart from the Border Stock, are located in the south of PNG and are connected geographically. The Border Stock is in the Sepik region, in the north of PNG. There is the possibility that these language groupings had SS/DS at some time in the past and have lost it during the course of time. For example, the Rumu language (Turama-Kikorian subphylum-level Stock) is one of a number of languages that has medial verb forms with a sequential versus simultaneous tense distinction marked but no SS/DS. So lack of SS/DS in some TNGP languages does not rule out the possibility that SS/DS is genetically inherited amongst other TNGP languages.

However, a second problem is that there are some non-TNGP language groups on mainland PNG that have SS/DS. These are primarily languages belonging to the Ramu Sub-Phylum located in Madang Province. Also at least one Sepik Hills (Sepik Sub-Phylum) language, Alamblak, has SS/DS. Since the Sepik-Ramu Phylum is not considered part of the TNGP, these languages could only have obtained their SS/DS systems by indirect morphosyntactic diffusion, i.e. the process whereby one language rearranges its inherited words and morphemes under the influence of a foreign model so that structural convergence occurs (from Heath 1978)

At this stage of research it is probably safe to say that SS/DS has become dispersed in PNG through a combination of genetic inheritance and contact with speakers of other languages. However, the fact that 24 of the 31 TNGP language stocks located in PNG have SS/DS does add credibility to the TNGP hypothesis itself.

3. THE FORMAL REALISATION OF THE SS/DS DISTINCTION

Of the 169 languages investigated in the survey 122 were found to have some type of SS/DS distinction marked morphologically and 47 were found not to have such a SS/DS system. Therefore over 70% of the languages investigated were found to have a SS/DS system. This figure is the same as the percentage of Papuan languages that are estimated to belong to the TNGP in Wurm, ed. (1975). So it is most likely representative of all Papuan languages.

The formal realisation of SS/DS was found to be highly heterogeneous in which at least seven different strategies could be identified in the languages that marked this distinction morphologically. All the languages found to have a SS/DS system were Papuan except for Dami (called Ham by Z'graggen 1975), which is an Austronesian (AN) language belonging to the Belan sub-family. To find an AN language in PNG with a SS/DS system is noteworthy since the only other AN language in the Pacific region known to have a SS/DS system is Lenakel, spoken on the central west coast of the island of Tanna in southern Vanuatu (see Lynch 1983).

Elliot (1979) describes the SS/DS system that Dami has presumably adopted from the neighbouring Papuan languages. This would appear to be a clear case of indirect morphosyntactic diffusion, since the form of the SS/DS system found in Dami bears little resemblance to the forms found in the surrounding Papuan languages, Table 4.

TABLE 4: COMPARISON OF AUSTRONESIAN AND PAPUAN SS/DS FORMS

	SS	DS
Dami	*-pen≈-ken* *-ma*	*-di*
Amele (N.E.)	*-me*	*-ʔV*
Girawa (W.)	*-moi* *-ia(nik)*	*-nuk* *-ta* *-na*
Erima (E.)		*-nga*

Amele is to the northeast, Girawa is to the west, Erima is to the east and to the south is the uninhabited flood plain of the Nuru river. Elliot (1990) also reports that the SS/DS markers in Dami attach to the final element in the clause which is normally but not always the verb. So Dami has reorganised its syntactic structure into SOV word order as well as modified its morphological structure to accommodate an alien SS/DS system.

Ross (1987) describes how some of the AN languages of the Belan sub-family, spoken in scattered coastal villages north-west and south-east of the town of Madang and on the offshore volcanic islands of Karkar and Bagabag, have developed sentence-medial verb forms similar to the neighbouring Papuan languages. The Bel languages that Ross cites are Takia, Matukar, Gedaged and Bilbil. However, while these AN languages have developed dependent medial verb types, none have developed a SS/DS system. Only Dami has taken the assimilation to Papuan morphosyntactic structure to this stage. The Dami SS/DS markers appear to be adaptations of the morphemes that indicate realis/irrealis modality and simultaneity in the other Bel languages. A comparison of the Bel sentence-medial verb forms is given in Figure 1 and it would seem to be the case that the Dami SS marker *-pen≈ -ken* is probably derived from the Bel realis/irrealis markers. The Dami SS marker *-ma* and the Dami DS marker *-di* are probably derived from the simultaneous markers in the other Bel languages; *-me* (Gedaged) and *-du* (Takia) or *-da* (Bilbil). So it would appear that the speakers of Dami at some stage in the development of the language have taken existing morphemes in the language and adapted them for a SS/DS system.

Takia sentence-medial verb:

$$\text{S: } + \text{STEM} + \left\{\begin{array}{ll} \varnothing & \text{'unmarked'} \\ \text{-}du & \text{'simultaneous'} \\ \text{-}gu & \text{'sequential'} \\ \text{-}na & \text{'durative'} \end{array}\right\} + \left\{\begin{array}{ll} \text{-}g[o] & \text{'realis'} \\ \text{-}p[e] & \text{'irrealis'} \end{array}\right\}$$

Gedaged sentence-medial verb:

$$\text{S: } + \text{STEM} + \left\{\begin{array}{ll} \varnothing & \text{'unmarked'} \\ \text{-}me & \text{'simultaneous'} \\ \text{-}la & \text{'sequential'} \end{array}\right\} + \left\{\begin{array}{ll} \text{-}g[e,a,\varnothing] & \text{'realis'} \\ \text{-}p[e,a,\varnothing] & \text{'irrealis'} \end{array}\right\}$$

Bilbil sentence-medial verb:

$$\text{S: } + \text{STEM} + \left\{\begin{array}{ll} \varnothing & \text{'unmarked'} \\ \text{-}da & \text{'simultaneous'} \end{array}\right\} + \left\{\begin{array}{ll} \text{-}g[a] & \text{'realis'} \\ \text{-}p & \text{'irrealis'} \end{array}\right\}$$

FIGURE 1: COMPARISON OF BEL SENTENCE-MEDIAL VERB FORMS

Appendix 1 details the findings with regard to the morphological realisation of SS/DS in the languages that have such a system. The Appendix is organised according to eight columns of formal categories which are described from left to right in the sections below.

3.1 MV TYPES (APPENDIX 1, COLUMN 1)

MV types note those languages that have different formal types of medial verb. A number of languages had two different types of medial verb which usually had different functions as well as different forms. The details of the differences are given below. The languages which have more than one type of medial verb are displayed in Table 5.

TABLE 5: MEDIAL VERB TYPES

Kuman	only MV1 is marked for SS/DS	MV2 is not marked for SS/DS
Chuave	only MV1 is marked for SS/DS	MV2 is not marked for SS/DS
Hua	only MV1 is marked for SS/DS	MV2 is not marked for SS/DS
Gimi	MV1 is marked for both SS/DS	MV2 is only marked for SS-SEQ/SIM
Baruya	MV1 is the 'regular' SS/DS marking	MV2 has a different SS marking for relative clauses
Kunimaipa	MV1 is marked for both SS/DS	MV2 is only marked for SS-SEQ/SIM
Mt. Koiali	MV1 is marked for both SS/DS	MV2 is marked for both SS/DS and REASON/ RESULT relationships
Agarabi	MV1 is marked for both SS/DS	MV2 is marked for SS.PURP
Kobon	MV1 is marked for both SS/DS	MV2 is marked for SS.PURP
Usan	MV1 is marked for both SS/DS	MV2 is marked for SS/DS.PURP
Ömie	MV1 is marked for both SS/DS	MV2 is marked for SS/DS.PURP

Three languages, Kuman, Chuave and Hua, have two different types of medial dependent verb, one of which is marked for SS/DS and one which is not. Thurman (1975)

says that the MV2 in Chuave does not indicate canonical SS/DS but rather functions to background events from the main event line. In Roberts (1988b) I argue that since in languages such as Amele and Irumu the canonical SS/DS system also has this function then in Chuave the MV2 can be considered part of the SS/DS system. This is discussed further in §7. With Gimi and Kunimaipa the MV2 appears to be a subset of MV1, only functioning on the SS verb in each case. With Baruya and Mt. Koiali, however, the MV2 has a special function in particular clause types. In Baruya the MV2 functions in relative clauses and in Mt. Koiali the MV2 functions in reason/result clauses. Four languages, Agarabi, Kobon, Usan and Ömie, have a distinctively marked MV2 form which expresses the category PURP(ose). This is discussed further in §4.5.

3.2 SS AND DS MARKING (APPENDIX 1, COLUMNS 2 AND 3)

SS and DS markings give the morphemes that mark SS or DS where these could be analysed morphologically. Sometimes a morpheme will have meanings in addition to SS or DS such as SEQ(uential), SIM(ultaneous), NONFUT(ure), FUT(ure), DUR(ative), PUNC(tual), or PURP(ose) and in these cases these meanings are also given. A language with SS markers that have an unusual additional meaning is Kewa. In Kewa SS.SEQ is marked by *-a* 'EGO' and *-wa* 'ALTO' and SS.SIM is marked by *-ri* 'EGO' and *-ma* 'ALTO'. The term 'EGO' means that the action is for the benefit of the actor whereas the term 'alto' means that the action is for the benefit of someone else or for some other reason. This is illustrated in (3a)-(3b).

(3)a. *Ní réko-a ágaa lá-lo.*
I stand-**SS.EGO** talk say-I.am
I stood up and am speaking.

b. *Ní rékaa-wa ágaa lá-lo.*
I stand-**SS.ALTO** talk say-I.am
I stood up on account of something and am speaking. (Kewa)

A ∅ means that there is no morpheme that could be identified solely with the category SS or DS. In most cases the SS or DS marker is a suffix, however, for some of the Angan languages it is a prefix. The SS morphemes in Angave and Kapau are prefixes and the DS morpheme in Baruya is a prefix. Haiman and Munro (1983:xii) note in their generalisations about SS/DS that in the case of the marked clause and the controlling clause being in a coordinate relationship, where the affix is a suffix the marking clause precedes the controlling clause and where the affix is a prefix the marking clause follows the controlling clause. However, with these Angan languages that have prefixed SS/DS marking the marking clause precedes the controlling clause even though they are in a coordinate relationship. In Angave, for example, which marks SS by the prefix *ni-*, the coordinating conjunction *aí* 'but' can occur within a SS/DS clause chain and can control the scope of the negation on the final verb, as illustrated in (4a)-(4b).

(4)a. *Awa ni-wiápinimea-r-o aiwá ni-ni-r-o aí múoi.*
3PLM SS-arise-?-3PL food SS-eat-?-3PL but NEG.go.PAST.3PL
They arose and ate but did not go.

b. *Awa ni-wiápinimea-r-o aí aiwá ni-ni-r-o múoi.*
3PLM SS-arise-?-3PL but food SS-eat-?-3PL NEG.go.PAST.3PL
They arose but did not eat and go. (Angave)

Some of the forms of the SS/DS markers show similarity both within and across certain language families. There are different patterns, as illustrated in Table 6. In the Ok family almost the same forms *-b(VC)* and *-s(VC)* are maintained for indicating DS across the three languages cited, while the form *-n(V)* is maintained for indicating SS across two of the languages. In the languages of the Huon Peninsula there is a different pattern. The same form, *-m(V)≈-w(V)*, occurs in a number of languages but in Timbe, Komba, Kube and Dedua it indicates SS, in Nabak and Wantoat it indicates DS and in Selepet two different variants are used to distinguish SS from DS. It is interesting that a similar form for SS also occurs in the Southern Bougainville languages of Nasioi, Nagovisi and Buin. The most striking correspondence, however, is the form *-gV≈-kV* for DS which occurs across a range of language families including the Chimbu, Gorokan, Koiarian and Southern Bougainville families.

TABLE 6: COMPARISON OF SS/DS FORMS ACROSS CERTAIN LANGUAGE FAMILIES

	SS	DS		SS	DS
Ok family:			Chimbu family:		
Telefol	*-nV*	*-bV*	Kuman		*-go*
		-sV			*-ko*
Mianmin	*-n*	*-b*	Chuave		*-goro*
		-s	Wahgi		*-nge*
Tifal		*-bad*	Maring		*-k*
		-sad			
Huon languages:			Gorokan family:		
Selepet	*-m*	*-mu*	Gende		*-go*
Timbe	*-mâ*		Benabena		*-go*
Komba	*-m*		Kamano		*-ke*
Nabak		*-ma*	Kanite		*-ke*
Kube	*-ma*		Yagaria		*-ga*
Dedua	*-ma*	*-de*	Hua		*-ga*
Wantoat		*-wa*	Fore	*-ki*	*-ki*
			Gimi		*-gV*
S. Bougainville family:			Koiarian family:		
Nasioi	*-ma*	*-ko*	Koiari		*-ge*
Nagovisi	*-ma*	*-ko*	Koita		*-ge*
Buin	*-mo*	*-gu*	Mt. Koiali		*-ge*
			Barai	*-gana*	*-ga*
			Ömie		*-go*

The data presented in Table 6 would suggest that within these language family groupings direct morphological diffusion has occurred whereby the form for SS/DS marking has been transferred directly even if the meaning of the original form has not been retained.

Some statistics can be extrapolated from Appendix 1 with regard to SS/DS marking. These are:

1. Languages which mark SS by ∅ only; i.e. there is no morphology for SS or subject agreement on the SS verb with each of these languages:

   Karkar-Yuri, Boiken, Salt-Yui, Maring, Kamano, Binandere, Ono, Kâte, Wantoat. [9 languages]

2. Languages which mark DS by ∅ only:

   One language, Banaro, marked DS with exactly this, zero morphology, whereas the SS form in this language is marked with *-ko*. Examples are given in (5a)-(5b) from Butler (1981). The meanings of the undefined abbreviations are: A(ddressee) D(eictic), SP(ecifier), R(ealis modality) and PRES(ent tense). [1 language]

   (5)a. *Ma kas na-ng i-ra-∅ ka na-ma-na-p parirrim-ka-se-t.*
   3SG dog AD-SP hit-SIM-DS dog AD-3SG-AD-SP run.away-R-PRES-3SG
   He hit the dog and the dog ran away.

   b. *Marakasong na-ma-na-p kas na-ng e-ka-ko parirrim-ka-se-t.*
   child AD-3SG-AD-SP dog AD-SP hit-R-SS run.away-R-PRES-3SG
   That child hit the dog and ran away. (Banaro)

3. Languages which mark SS by an analysable morpheme with no other meaning:

   Telefol, Mianmin, Tifal, Samo, Podopa, Kwanga, Alamblak, Botin, Chuave, Kaugel, Kandawo, Gende, Siane, Gahuku, Benabena, Fore, Gimi (MV1 only), Gadsup, Kosena, Banaro, Nend, Apali, Usan, Waskia, Amele, Anjam, Siroi, Koromu, Dami, Tauya, Rawa, Kewieng, Nankina, Guhu-Samane, Baruya, Angave, Kapau, Weri, Kunimaipa (MV1 only), Tauade, Koiari, Koita, Mt. Koiali, Barai, Managalasi, Yareba, Burum, Komba, Nabak, Selepet, Kube, Dedua, Uri, Kovai, Kanasi, Buin. [57 languages]

4. Languages which mark DS by an analysable morpheme with no other meaning:

   Telefol, Mianmin, Samo, Podopa, Karkar-Yuri, Washkuk, Kwanga, Boiken, Alamblak, Botin, Enga, Kuman, Chuave, Wahgi, Maring, Gende, Siane, Benabena, Kamano, Kanite, Yagaria, Gimi (MV1 only), Kalam, Waskia, Amele, Erima, Siroi, Dami, Tauya, Binandere, Guhu-Samane, Baruya, Wojokeso, Menya, Kapau, Angaataha, Tainae, Weri, Kunimaipa (MV1 only), Koiari, Koita, Mt. Koiali, Barai, Ömie, Managalasi, Daga, Kanasi, Yareba, Selepet, Nabak, Dedua, Wantoat, Uri, Buin. [52 languages]

5. Languages which indicate SS by ∅ and DS by an analysable morpheme:

   Karkar-Yuri, Boiken, Wahgi, Maring, Kamano, Yagaria, Erima, Wojokeso, Menya, Angaataha, Tainae, Daga, Wantoat. [13 languages]

6. Languages which indicate both SS and DS by analysable morphemes with no other meaning:

   Telefol, Mianmin, Samo, Podopa, Alamblak, Chuave, Gende, Siane, Benabena, Gimi, Waskia, Amele, Siroi, Dami, Tauya, Rawa, Guhu-Samane, Baruya, Kapau, Weri, Kunimaipa, Koiari, Koita, Mt. Koiali, Barai, Managalasi, Kanasi, Yareba, Burum, Nabak, Selepet, Dedua, Uri, Buin. [34 languages]

3.3 MARKSU (APPENDIX 1, COLUMN 4)

Marked subject (MarkSu) indicates whether the marked clause carries subject agreement for its own subject and, if so, whether this agreement occurs on the SS or DS verb or both. The † indicates that the MarkSu on the medial verb is not the same as that which occurs on the final verb. In Alamblak, for example, subject agreement for the marked clause is only indicated on the DS medial verb, as in (6) for example. The meanings of the undefined abbreviations are: IRR(ealis modality) and IMM(ediate)P(ast tense).

(6) *Bro ñiñt yënr hoi-t-t-r to nhai fiñji noh-r-fë-r.*
big centipede child sting-**DS-3SGF**-3SGM.O but no NEG die-IRR-IMMP-3SGM
A big centipede stung a child, but no, he did not die. (Alamblak)

In a number of languages the distinction between SS versus DS was marked just by different sets of MarkSu, namely Oksapmin, Nii, Waffa, Kobon, Amele (SIM only), and Nobonob. In Kobon, for example, SS versus DS is simply marked by different sets of MarkSu. In Amele, on the other hand, just for the SIM(ultaneous) verb the SS versus DS distinction is indicated by different sets of MarkSu and there is a three-way distinction between SIM.SS, SIM.DS.REALIS and SIM.DS.IRREALIS. In Nobonob a five-way distinction is marked on the SS/DS medial verb by different sets of MarkSu between simple SS and DS.SEQ REALIS versus IRREALIS and DS.SIM REALIS versus IRREALIS. In addition SS.SEQ is marked with *-o* and SS.SIM is marked by reduplication in Nobonob. This is illustrated in Table 7.

TABLE 7: COMPARISON OF KOBON, AMELE AND NOBONOB SS/DS MARKSU FORMS

Kobon		
	SS	DS
1SG	*-em*	*-nö*
2SG	*-mön≈-ön*	*-ö*
3SG	*-öm*	*-ö*
1DU	*-ul*	*-lo*
2/3DU	*-mil*	*-lö*
1PL	*-un*	*-no*
2PL	*-mim*	*-be*
3PL	*-öm*	*-lö*

Amele			
	SIM.SS	SIM.DS REALIS	SIM.DS IRREALIS
1SG	*-g*	*-gin*	*-min*
2SG	*-g*	*-gan*	*-m*
3SG	*-i*	*-n*	*-b*
1DU	∅	*-won*	*-hul*
2/3DU	*-si*	*-sin*	*-bil*
1PL	*-b*	*-qon*	*-mun*
2/3PL	*-ig*	*-gin*	*-bil*

Nobonob							
	SS	SS.SEQ	SS.SIM	DS.SEQ REALIS	DS.SEQ IRREALIS	DS.SIM REALIS	DS.SIM IRREALIS
1SG	*-ena≈-ina*	*-oya*	*-eCe*	*-pi*	*-i*	*-(i)yi*	*-pipi*
2SG	*-na*	*-ona*	*-nana*	*-e*	*-pe*	*-eCe*	*-pepe*
3SG	*-a*	*-owa*	*-aCa*	*-e≈∅*	*-eb*	*-eCe*	*-ebeb*
1DU	*-da*	*-oda*	*-dada*	*-ud*	*-pud*	*-udud*	*-pupud*
2/3DU	*-ya*	*-oya*	*-yaya*	*-eh*	*-ped*	*-eheh*	*-peped*
1PL	*-at*	*-ota*	*-tata*	*-ut*	*-put*	*-utut*	*-puput*
2/3PL	*-na*	*-ona*	*-nana*	*-eg*	*-peg*	*-egeg*	*-pepeg*

Some statistics can be extrapolated from Appendix 1 with regard to SS/DS marking and MarkSu. These are:

1. Languages which indicate SS by ∅ and DS by MarkSu. There are two subtypes:

1a. For one language the DS verb was marked in the same way as a final verb therefore the category DS as such was unmarked:

Salt-Yui. [1 language]

1b. For the following languages the MarkSu on the DS verb was different from that on the final verb therefore the category DS was marked:

Ono, Kâte. [2 languages]

2. Languages which indicate SS by a particular morpheme and DS by MarkSu. There are two subtypes:

2a. For the following languages the DS verb was marked in the same way as a final verb therefore the category DS as such was unmarked:

Gadsup, Tairora, Kandawo, Kube, Kovai. [5 languages]

2b. For the following languages the MarkSu on the DS verb was different from that on the final verb therefore the category DS was marked:

Kosena, Nend, Apali, Nankina, Yau, Angave, Komba, Tauade. [8 languages]

3. Languages which indicate the SS/DS distinction only by a particular set of MarkSu for SS and another set for DS:

Oksapmin, Nii, Waffa, Kobon, Amele (SIM only), Nobonob. [6 languages]

3.4 ANTICSU (APPENDIX 1, COLUMN 5)

The column Anticipatory subject (AnticSu) indicates whether the marked clause carries AnticSu agreement for the subject of the following clause and, if so, whether this agreement occurs on the SS or DS verb or both. Note that AnticSu is different from MarkSu. In Kanite SS is marked by ∅. However, DS is marked by MarkSu + *-ke* + AnticSu. The categories SEQ and SIM are marked by *-te* and *-ne* respectively and can occur with either the SS or DS verb. The MarkSu morphology is different from the AnticSu morphology as illustrated in Table 8.

TABLE 8: COMPARISON OF KANITE MARKSU AND ANTICSU FORMS

	MarkSu	AnticSu
1SG	*-u*	*-ʔna*
2SG	*-an*	*-ʔka*
3SG	*-i*	*-no*
1DU	*-uʔ*	*-taʔa*
2DU	*-aʔ*	*-tana*
3DU	*-aʔ*	*-ʔana*
1PL	*-un*	*-ta*
2PL	*-a*	*-tapa*
3PL	*-a*	*-ʔya*

Examples are given in (7a)-(7b) of the function of the MarkSu and AnticSu morphology in Kanite. The meanings of the undefined abbreviations in example (7) are: PROG(ressive aspect) and IND(icative mood).

(7)a. *A-ke-ne-ʔna* *neʔ-v-u-e.*
3SG.O-see-SIM-1SG PROG-go-1SG-IND
As I was looking at him I was going.

b. *A-ke-n-o-ke-no* *neʔ-v-i-e.*
3SG.O-see-SIM-**1SG-DS-3SG.ANTICSU** PROG-go-3SG-IND
As I was looking at him he was going. (Kanite)

In Kanite the AnticSu marks DS along with the DS marker *-ke* itself. Contrast this with Hua, a language related to Kanite. In Hua both the SS and DS verb are marked for AnticSu but only the DS verb is marked for MarkSu. It is therefore the presence or absence of MarkSu[4] that distinguishes DS from SS in this language, as in (8a)-(8b) for example.

(8)a. *Ebgi-∅-na* *korihie.*
hit-SS-3SG.ANTICSU ran.away.3SG
He$_i$ hit him$_j$ and he$_i$ ran away.

b. *Ebgi-ga-na* *korihie.*
hit-**3SG.DS**-3SG.ANTICSU ran.away.3SG
He$_i$ hit him$_j$ and he$_j$ ran away. (Hua)

In some languages that have an AnticSu system but mark the SS or DS category with an invariable morpheme it can be demonstrated that they do not code exactly the same thing. Kosena, example (9), marks SS with the morpheme *-é* followed by markers that agree in person and number with the subject of the following clause. The DS.SEQ verb is marked by a tense marker (past, present or future), then a subject agreement marker (MarkSu) that agrees with the subject of the marked verb and then a subject agreement marker (AnticSu) that agrees with the subject of the following verb. However, in (9) *maima-é-ˈa* 'I get/put-SS-1SG' indicates same subject following according to the SS/DS system and is marked as anticipating a 1SG subject when in fact the subject of the following clause is 3SG and

4 Haiman (1980) is ambivalent as to whether *-ga* in Hua is a different subject marker as such or a subject agreement marker.

corresponds to the object *kwáálúse* 'aeroplane' in the previous clause. This actually indicates that the subject *kwáálúse* 'aeroplane' is semantically subordinate to the subject 'I' in some way. So although the subjects have changed grammatically across these clauses, the focus of attention is still on the subject 'I'. This can be seen by the fact that *másiyúwáisa'a* 'here-1SG.O-leave-PRES-3SG(DS)-1SG', the verb that follows *maimaé'a*, is marked as DS according to the SS/DS system and as anticipating a 1SG subject. The SS/DS system marks the fact that the verb *másiyúwáisa'a* has a semantically subordinate subject while the AnticSu keeps track of the primary or topical subject. So it can be seen that the SS/DS system functions differently from the AnticSu system in Kosena.

(9) *Is-é-'a ániva mi minkáké kwáálúse maima-é-'a Talamo'*
hear-SS-1SG so that then aeroplane get/put-SS-1SG Tarabo
má-si-yúwá-is-a-'a minkáké síp-iv mal-é-'a
here-1SG.O-leave-PRES-3SG(DS)-1SG then jeep-in put-SS-1SG
Okáva moi-si-yúwá-is-a-'a ...
Okapa up-1SG.O-leave-PRES-3SG(DS)-1SG

I heard it, and then I got an aeroplane, and it left me at Tarabo, and then I got a jeep, and it left me at Okapa ... (Kosena)

For several languages that have an AnticSu system these markers have been identified as pronominal in origin. This is the case for Benabena (Young 1971), Yagaria (Renck 1975), Fore (Scott 1978) and Hua (Haiman 1980). For Benabena and Fore the AnticSu markers are particularly identified with the possessed noun morphology. A comparison is given in Table 9 of the possessive pronouns and AnticSu markers in Benabena.

TABLE 9: COMPARISON OF POSSESSIVE PRONOUNS AND ANTICSU MARKERS IN BENABENA

	Possessive pronouns	AnticSu markers
1SG	*nani-'ni*	*-'ni*
2SG	*kai-ka*	*-ka*
3SG	*ai-'a*	*-'a*
1DU	*le'ali-ti'a*	*-ti'a*
2DU	*letali-titi*	*-titi*
3DU	*etali-'atiti*	*-'atiti*
1PL	*lali-ti*	*-ti*
2PL	*lenali-tini*	*-tini*
3PL	*enali-'ani*	*-'ani*

As far as can be ascertained there are only two languages in PNG which mark the difference between SS and DS purely by AnticSu. These are Agarabi and Auyana-Usarufa. Examples are given from Agarabi, (10a)-(10b). The meaning of the undefined abbreviation is NEUT(ral tense).

(10)a. *Téhi ér-e-h te-h-ú.*
1SG come-NEUT-1PL say.NEUT-IND-1PL
I came and spoke.

b. *Éhi ér-e-tí-n* *wéhi te-m-íH.*
2SG come-NEUT-2PL-**3PL.ANTICSU 3SG** say.NEUT-IND-3PL
You came and they spoke. (Agarabi)

Finally it should be noted that AnticSu marking is restricted almost entirely to the Gorokan and Kainantu languages and may be posited to be an areal phenomenon related to these particular language families. The exceptions are the Anggor and Nai languages in the West Sepik which also have an AnticSu system.

Some statistics can be extrapolated from Appendix 1 with regard to SS/DS marking and AnticSu. These are:

1. Languages which indicate DS by AnticSu. There are two subtypes:

1a. Those languages which marked AnticSu only on the DS verb but DS was indicated morphologically in some other way than by AnticSu:

Anggor, Kamano, Kanite, Gimi (MV1). [4 languages]

1b. Those languages which marked AnticSu only on the DS verb and DS was not marked morphologically in any other way than by AnticSu:

Agarabi, Auyana-Usarufa. [2 languages]

3.5 ORDER (APPENDIX 1, COLUMN 6)

The column 'order' indicates the order in which the SS/DS markers, MarkSu morphology and AnticSu morphology occur. The results of Bybee's morphological survey (1985:34-35) give confirmation of the hierarchical ordering of the most frequently encountered verbal inflectional categories with respect to proximity to the verb stem, namely:

$$\text{VERB STEM} < \text{ASPECT} < \text{TENSE} < \text{MOOD} < \left\{\begin{matrix}\text{PERSON} \\ \text{NUMBER}\end{matrix}\right\}$$

This indicates that subject person and number agreement invariably occur as the affix furthest away from the verb stem. The purpose of this part of the survey was to see if any basic ordering could be established between the categories of SS/DS and MarkSu. The different orderings can be summarised as in Table 10.

There were 33 languages with the order of MarkSu + SS/DS, 18 languages with the order of SS/DS + MarkSu, and 8 languges with the order of MarkSu + AnticSu. More languages had the order of MarkSu + SS/DS than SS/DS + MarkSu but the minimal difference in the numbers would suggest that the ordering of these two categories is not critical. It would also suggest that they are part of the same general category of nominal reference marked on the verb. Note that several languages, namely Gimi, Baruya and Kapau, in fact, had both orders. Also note that AnticSu always follows SS/DS. This would suggest that the category AnticSu is distinct from the categories SS/DS and MarkSu and probably developed later.

TABLE 10: ORDERINGS OF MARKSU AND SS/DS MORPHOLOGY

Languages with order of MarkSu + SS/DS:

Angaataha	MarkSu + DS
Anggor	MarkSu + DS + AnticSu
Binandere	MarkSu + DS
Baruya	MarkSu + SS
Bau	MarkSu + SS/DS
Boiken	MarkSu + DS
Burum	MarkSu + DS
Chuave	MarkSu + DS
Daga	MarkSu + DS
Dedua	MarkSu + DS
Enga	MarkSu + DS
Erima	MarkSu + DS
Kamano	MarkSu + DS + AnticSu
Kanite	MarkSu + DS + AnticSu
Koromu	MarkSu + DS
Kuman	MarkSu + DS
Kunimaipa	MarkSu + SS/DS
Gende	MarkSu + SS/DS
Gimi	MarkSu + DS + AnticSu
Gumalu	MarkSu + SS/DS
Isebe	MarkSu + SS/DS
Kapau	MarkSu + DS
Kandawo	MarkSu + SS/DS
Maring	MarkSu + DS
Medlpa	MarkSu + SS
Nai	MarkSu + SS/DS + AnticSu
Siane	MarkSu + DS
Sihan	MarkSu + SS
Tauya	MarkSu + DS
Tainea	MarkSu + DS
Wahgi	MarkSu + DS
Yagaria	MarkSu + DS + AnticSu
Yareba	MarkSu + SS/DS

Languages with order of SS/DS + MarkSu:

Alamblak	DS	+ MarkSu
Amele	SS/DS	+ MarkSu
Angave	SS	+ MarkSu (prefix to verb)
Anjam	SS/DS	+ MarkSu
Baruya	DS	+ MarkSu (prefix to verb)
Gimi	SS	+ MarkSu
Mianmin	SS/DS	+ MarkSu
Menya	DS	+ MarkSu
Nabak	DS	+ MarkSu
Panim	SS/DS	+ MarkSu
Rawa	DS	+ MarkSu
Selepet	DS	+ MarkSu
Sihan	DS	+ MarkSu
Tairora	SS	+ MarkSu
Telefol	SS/DS	+ MarkSu
Tifal	SS/DS	+ MarkSu
Kapau	SS	+ MarkSu (prefix to verb)
Wojokeso	DS	+ MarkSu

Languages with order of MarkSu + AnticSu:

Benabena	SS/DS	+ AnticSu
Hua	DS/MarkSu	+ AnticSu
Fore	SS/MarkSu	+ AnticSu
Gadsup	SS/MarkSu	+ AnticSu
Kosena	SS/MarkSu	+ AnticSu
Agarabi	MarkSu	+ AnticSu
Awa	MarkSu	+ AnticSu
Usarufa	MarkSu	+ AnticSu

3.6 NON-VERB (APPENDIX 1, COLUMN 7)

The column of 'non-verb' notes the occurrence of SS/DS markers with items other than verbs. According to Jacobsen's survey (1983) of SS/DS North American Indian languages many of these languages have sentence-introducing particles to which the SS/DS suffixes can be attached, rather than being suffixed to the final verb of the preceding clause. In the present survey of PNG languages, while no language was found with such sentence-

introducing particles, for two languages the SS/DS morphemes can be marked on non-verb sentence substitutes such as pronouns. This is the case for Ambulas (Wilson 1980) and Kewa (Franklin 1983). Wilson (1980:54) reports that in Ambulas the vocative suffixes *-o* 'same actor' and *-a* 'different actor' can be added to the basic stem of the 2nd person personal pronoun which then functions as an exclamatory sentence fragment, e.g. *mén-a* 'You-DS!'. Franklin (pers.comm.) reports that in Kewa the SS form, *-ma*, that normally occurs with verbs is also used with the deictic *go* as a thematic connective between sentences. So *go* + *ma* → *guma*. The SS *-ma* therefore functions quite independently of the verbs, unless the deictics are considered to function as a verb.

In Siroi SS is marked by a dependent verb plus the morpheme *-mba*, which, according to Van Kleef and Van Kleef (1988), can be analysed as the verb *mb-* 'ascend' and the dependent suffix *-a*. In Siroi DS is marked by an independent verb plus the conjunction *le*.

3.7 DS+SS (APPENDIX 1, COLUMN 8)

Column 8, 'DS+SS' represents the occurrence of DS and SS markers on the same medial verb. In Roberts (1988b) I describe how it is possible in the Irumu language to mark both DS and SS on the same verb for different functional purposes. In Irumu SS is indicated by a range of analysable morphemes which in addition carry other meanings relating to the basic relative tense distinction of SEQ versus SIM. The SS markers are *-päŋ* 'SEQ', *-peŋ* 'SEQ for a motion verb', *-kaŋ* 'SIM.PUNC', *-maŋ* 'SIM.PUNC for a motion verb', *-täŋ* 'SIM.DUR'. DS is indicated by sets of subject agreement markers similar to forms that occur on final verbs. So DS.SEQ is indicated by the set <*-Pän*>, DS.SEQ.DUR is indicated by *-täŋ* + the set <*-Yon*> and DS.SIM is indicated by *-iT* + the set <*-Pän*>. The SS and DS forms can be marked on the same verb to indicate referential overlap, which is completely symmetrical in Irumu, as in (11) for example. The meaning of the undefined abbreviation is REM(ote)P(ast tense).

(11) *KikŋuT-Pa-kaŋ ämKu-mäŋ.*
startle-1SG.**DS-SS** come-REMP-1PL
I was startled and/as we came. (Irumu)

The survey revealed that several other Papuan languages also exhibited this phenomenon of being able to mark both DS and SS on the same verb. Reed (1989) describes how Yupna (Kewieng), another language of the Finisterre-Huon stock, is able to mark both DS and SS on the same verb. Yupna marks SS.SEQ by *-ŋ* or ∅ and SS.SIM by *-eek*. For DS, a particular set of subject agreement markers, <*-apbo*>, indicate DS.SEQ and another set, <*-kwo*>, indicate DS.SIM. An example from Yupna is given in (12).

(12) … *pi u-don a-mək. A-ndo modəŋ-bən-eek*
… work there-GIVEN do-1DU.PRES do-DS.SEQ.1DU finish-**DS.SEQ.3SG-SS.SIM**
ae nyit pi-ŋ …
again 1DU come.down-SS.SEQ
… we work there. When we have finished working we come down again … (Yupna)

Lauver and Wegmann (1990) describe how in Yau, another language of the Finisterre-Huon stock, it is possible to mark both DS and SS on the same verb. The system in Yau is more complex, however, than that found in Irumu and Yupna. Yau marks 'normal' SS/DS by

an invariable morpheme for SS, *-ŋ*, and DS is marked by a particular set of MarkSu, <*-a*>, as detailed in Table 11 below. However, Yau has a second set of DS MarkSu, <*-maina*>, also detailed in Table 11 below, which can be suffixed after the normal SS marker. This suffixation only applies when the subject of the following verb is included referentially in the subject of the marked verb or when the subjects are identical and the action is simultaneous. Notice that with the system 2 MarkSu.DS it is possible to separate this morphology into system 1 MarkSu.DS plus the discontinuous morpheme, *ma...ina.*

TABLE 11: YAU SYSTEMS OF MARKSU.DS

	MarkSu.DS System 1	MarkSu.DS System 2
1SG	*-a*	*-m>a<ina*
2SG	*-i*	*-m>i<na*
3SG	*-un*	*-m>un<a*
1DU	*-ta*	*-ma>ta<ina*
2/3DU	*-un*	*-m>un<ya*
1PL	*-na*	*-ma>na<ina*
2/3PL	*-u*	*-m>u<ya*

However, it is the case in Yau that either of the system 1 SS/DS markings are ungrammatical in place of the system 2 DS marking, as illustrated in (13) . According to Lauver and Wegmann (1990) the meaning of the medial verb suffix *-Ka≈-ya* is unclear and no regular pattern for its usage has been discerned. The meaning of the undefined abbreviation in (13) is EMPH(atic).

(13) *Non nacno so-ŋ-manaina /*-ŋ-Ka /*-na-ya noc nakha-kon*
1PL food cook-SS-1PL.**DS2** /-SS-? /-1PL.DS1-? 1SG 1SG.EMPH-only
na-go-t.
eat-REMP-1SG
We cooked the food and I ate it myself. (Yau)

As already mentioned when DS+SS is marked in the Yau medial verb and the subjects of the marked and controlling clauses are identical then SIM is indicated, as in (14) for example.

(14) *Dorong oho-ŋ-maina ipic a-kot.*
Dorong descend-SS-1SG.**DS2** snake see-1SG.REMP
While going down to Dorong I saw a snake. (Yau)

The Nend language in Madang Province can also mark DS and SS on the same verb for various functional purposes, as described in Harris (1990:120). Harris says that the context in which this construction occurs is where there is a change of subject but not a loss of control by the original subject over the situation. In Nend SS is indicated by an analysable morpheme, *-e*, and DS is indicated by a set of subject agreement markers that are unique to the medial verb. The form of the DS+SS marking in Nend is somewhat different to that in Irumu and Yupna. In Nend the SS marker precedes the DS marker and the irrealis marker *-mi* occurs in between. This is illustrated by (15) where an iterative verb with a human/

animate subject is co-referenced with a following inanimate subject. The meaning of the undefined abbreviation is H(istorical)P(ast tense).

(15) *Na-mg-e-mi-z* *na-mg-e-mi-z* *unsiŋ-mb-am* *ñi-m-a-l.*
eat-P-**SS**-IRR-3SG.**DS** eat-P-**SS**-IRR-3SG.**DS** bone-SUBJ-only stay-IRR-HP-3
They ate and ate and there were just bones left. (Nend)

Another language in Madang Province can mark DS+SS and that is Apalɨ (Emerum) described by Wade (1989). In Apalɨ SS is indicated by the morpheme *-vila* and DS is indicated by a set of subject agreement markers that are unique to the medial verb. The main function of the DS+SS marking in Apalɨ is to indicate that the subject of the following clause is a subset of the subject of the marked clause, as in (16) for example. The meanings of the undefined abbreviations are: DEF(inite) and NOM(inalised).

(16) *Ve-mɨli-vila* *Imalɨmi* *aga-ŋ* *ab-∅-i* ...
come-1PL.**DS-SS** DEF-NOM talk-1PL.O-3SG
We all came and Imalɨmi said to us ... (Apalɨ)

3.8 SUMMARY DISCUSSION OF THE DATA IN APPENDIX 1

The statistics abstracted from Appendix 1 for the various means of marking the SS/DS distinction in PNG languages can be summarised as follows, where X and Y stand for invariable morphemes:

(i)	SS = ∅, DS = Y,	18 languages
(ii)	SS = X, DS = ∅,	1 language
(iii)	SS = X, DS = Y,	55 languages
(iv)	SS = ∅, DS = MarkSu,	10 languages
(v)	SS = X, DS = MarkSu,	36 languages
(vi)	SS = MarkSu_i, DS = MarkSu_j,	6 languages
(vii)	SS = not AnticSu, DS = AnticSu,	6 languages

So at least seven different morphological strategies are used overall to indicate the SS/DS distinction. Out of the 122 languages listed in Appendix 1 as having a SS/DS distinction 46 marked MarkSu agreement on the DS verb but not on the SS verb. Of these 20 had MarkSu†, i.e. non-final forms. The other 75 languages either marked MarkSu on both SS and DS verbs or on neither. Of the 46 languages with MarkSu on the DS verb 20 had additional morphology to indicate the DS category. Therefore only 26 languages out of the 122 (i.e. 21%) marked DS solely by MarkSu. 73 languages out of the 122 marked DS by a non-MarkSu invariable morpheme, i.e. 60%. So by far the majority of PNG languages mark DS by a non-MarkSu invariable morpheme. Even so, a significant number of PNG languages do use the MarkSu strategy for indicating DS unlike languages in Australia and North America, for example.

For most of the languages the SS/DS marking was found to be a purely binary distinction of [+SS –DS] versus [–SS +DS] and the SS/DS morphology related primarily to the syntactic subject of the following clause. So the prototypical meaning of SS was 'same subject following' and the prototypical meaning of DS was 'different subject following'. However,

for some languages, namely Irumu, Yupna, Yau, Nend and Apali, it was found that a trinary distinction could be marked of [+SS –DS], [–SS +DS] or [+SS +DS]. In the cases of Irumu, Yau and Apali such marking indicated referential overlap between the subject of the marked clause and the subject of the controlling clause. In the case of Nend the DS+SS marking indicated that, while there was a change in syntactic subject, the 'notional' or topical subject remained the same. In each of these languages the DS+SS marking indicated that, while some properties of the following subject change, other properties remain the same, thus a split DS+SS is marked.

It was found that in the vast majority of PNG languages, being SOV word order, the SS/DS distinction is marked by suffixation on the verb. However, in some of the Angan languages, namely Angave, Kapau and Baruya, SS/DS is marked by a prefix on the verb. It was also found that, while in the vast majority of PNG languages SS/DS is marked on the verb, in a few languages, namely Ambulas and Kewa, the SS/DS marking can occur on a non-verbal item. In the case of Ambulas and Kewa, however, this non-verbal item could only be a pro-clausal substitute such as a vocative or demonstrative pronoun.

Many North American Indian languages mark SS/DS extensively on anaphoric particles which are independent of the verb. This prompted Comrie's suggestion that SS/DS is really marked on the clause and only attaches to the verb because it is head of the clause:

> Given that most languages with switch-reference are verb-final, one might argue that the correct characterisation is not so much that the verb is marked, but rather that the clause is marked in final position ... I would like to suggest a more neutral characterisation, which has the added advantage of also including another kind of switch-reference, discussed by Jacobsen (1967), viz. where switch-reference is indicated by a sentence-particle independent of the verb (Comrie 1983:23).

The findings in PNG languages therefore substantiate Comrie's hypothesis that SS/DS is really a category of the clause and is only marked on the verb as the head of the clause or on a pro-clausal substitute. Indeed most, if not all, PNG languages with a SS/DS system are pro-drop so the only obligatory item in the clause is the verb. Also, as Foley (1986:167-175) points out, the syntax of many PNG languages is controlled by verbal morphology rather than word order such that all core NP arguments can be marked on the verb. In Amele, for example, the core NP arguments of subject, direct object (DO), indirect object (IO), and oblique object (OO) can all be cross-referenced on the verb.[5] An example from Amele is given in (17) where the subject, plural DO and benefactive (OO) arguments are all coded on the verb. Another example is given in (18) where the clause comprises just a verb coded for the NP arguments of subject, recipient (IO), and benefactive (OO). The meaning of the undefined abbreviation in (17) and (18) is PRED(icate marker).

(17) *Uqa jo eu ceh-ad-i-t-en.*
3SG house that build-**3PL.DO**-PRED-**1SG.OO**-3SG.REMP
He built those houses for me. (Amele)

(18) *Siw-i-ad-i-h-ig-en.*
share-PRED-**3PL.IO**-PRED-**2SG.OO**-1SG-FUT
I will share (it) out to them for you. (Amele)

---

5 For a fuller treatment of object agreement marking in Amele see Roberts (1993a).

An analysis of the orderings of SS/DS, MarkSu and AnticSu markers on the verb showed that there was no significant difference in the orders that SS/DS and MarkSu occurred. Somewhat more languages had the order MarkSu + SS/DS (33) than had the order SS/DS + MarkSu (18). However, what was significant was that where the category AnticSu was marked it always followed the SS/DS/MarkSu markers. It was also significant that for a number of languages, namely Benabena, Yagaria, Fore and Hua, the AnticSu markers in these languages have been identified as pronominal in origin. Specifically, in each case they can be identified with the possessive pronoun agreement morphology. This would therefore indicate that the function of the AnticSu markers in these languages is to nominalise the clause.

4. GRAMMATICAL CATEGORIES ASSOCIATED WITH SS/DS SYSTEMS

In a language that has the SS/DS distinction marked on the verb this morphology usually occurs on the dependent or medial form of the verb, which itself is distinguished from the independent or final form of the verb. As already mentioned above, medial verb forms are typically inflected for a different range of verbal categories than the corresponding final verbs in the language. In Amele, for example, final verbs can be inflected for REM(ote)-P(ast), YEST(erday's)P(ast), TOD(ay's)P(ast), PRES(ent), FUT(ure) and REL(ative)F(uture) tenses, HAB(itual)P(ast) aspect or IMP(erative) and CO(u)NT(e)R(factual) moods. In contrast, the medial verbs can be inflected for SS/DS, SEQ(uential) versus SIM(ultaneous) tense, DUR(ative) versus PUNC(tual) aspect, REALIS versus IRREALIS modality and COND-(itionality). These contrasts are summarised in Table 12.

TABLE 12: AMELE BERB CATEGORIES

	SS/DS	Tense	Aspect	Mood, modality
Medial	SS versus DS	SEQ versus SIM	DUR versus PUNC	REALIS versus IRREALIS, COND
Final		REMP, YESTP, TODP, PRES, FUT, RELF	HABP	IMP, CONTR

In the language sample it was found that there were a number of grammatical categories that were commonly marked on the medial SS/DS verb similar to the Amele case. These associated categories are displayed in Appendix 2. They included the relative tense categories of SEQ versus SIM tense (column 1) and the aspectual categories of DUR versus PUNC aspect (column 2). These two oppositions normally function to indicate different temporal relationships that the marked clause has with the following controlling clause. It was also the case that absolute tense, i.e. past, present or future tense, could be marked on the medial SS/DS verb in some languages (column 3). Sometimes the same categories were marked on the medial verb as were marked on the final verb. However, quite often the medial verb absolute tense categories were reduced or neutralised from the final verb tense categories in some way. For example, in a given language where the final verb might be marked for several degrees of past tense the medial verb might be marked for just a single past tense. Or another example would be where the medial verb is only marked for a future versus non-future distinction in contrast to a full range of final verb tense categories. In fact,

in some languages with a future versus non-future distinction marked on the medial verb this has developed into a modal distinction of realis (non-future) versus irrealis (future) modality (column 4). Two categories that would normally be expressed in a subordinate clause were also attested to be marked on SS/DS medial verbs, i.e. purpose (column 5) and conditionality (column 6). For each of these categories an indication is given as to whether the category occurs with the SS or DS verb or with both. It was also found that two other categories can have a controlling influence on the SS/DS marking. These were the categories of person and number (column 7).

4.1 SEQ/SIM (APPENDIX 2, COLUMN 1)

By far the most common category associated with SS/DS was the category of SEQUENTIAL versus SIMULTANEOUS relative tense. This category occurred in 69 of the 122 languages listed in Appendix 1 with a SS/DS system, i.e. in 57% of cases. In fact, it was found that in every case this category occurred exclusively with the SS/DS medial verb, unlike the other categories, all of which were found to be marked on final independent verbs as well as medial dependent verbs. In most descriptions this distinction was defined as describing events occurring one after another (SEQ) as opposed to describing two events that overlapped in time occurrence to some degree (SIM). Therefore the basic distinction is that of concurrence versus non-concurrence of events in the temporal domain, as displayed in Figure 2.

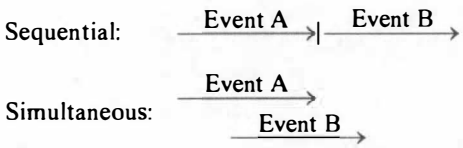


FIGURE 2: SEQUENTIAL VERSUS SIMULTANEOUS EVENTS

In most cases the focus of meaning is on the time orientation rather than on the possible aspectual meaning of perfective (bounded event) versus imperfective (unbounded event). For example, in Amele the SEQ medial verb can only be used to describe a temporal succession of consecutive events. It cannot be used to describe events that are not in linear sequence.[6] So (19a) could only be interpreted as having the second meaning. To express the first meaning under (19a) a series of clauses containing final verbs would have to be used, as in (19b).

(19)a. *Ija alal te-ce-b wa gab te-ce-b wen*
1SG weariness 1SG.DO-DS-3SG water cup 1SG.DO-DS-3SG hunger
te-i-a.
1SG.DO-3SG-TODP
*I was tired, thirsty and hungry.
I was tired and then thirsty and then hungry.

6 This simple test for distinguishing sequential tense from perfective aspect was first suggested by Comrie (1985:27).

b. *Ija alal te-i-a, wa gab te-i-a, wen te-i-a.*
1SG weariness 1SG.DO-3SG-TODP water cup 1SG.DO-3SG-TODP hunger 1SG.DO-3SG-TODP
I was tired, thirsty and hungry. (Amele)

In the survey unless evidence was presented to the contrary I have assumed that what is described as 'sequential versus simultaneous action' is a tense distinction and not an aspectual distinction of perfective versus imperfective aspect. 45 languages marked SEQ/SIM on both SS and DS verbs, 18 languages marked SEQ/SIM on just SS verbs and 7 languages marked SEQ/SIM on just DS verbs. The most common means of marking the SEQ versus SIM distinction was by an analysable morpheme but some languages employed other means. In Kaugel SEQ is indicated by MarkSu + *-lie* and SIM is indicated by *-li* + MarkSu, i.e. a change in order. In a number of languages a particular set of MarkSu is employed to indicate the SEQ/SIM distinction. In Kosena DS.SEQ is indicated by MarkSu (future form) + AnticSu and DS.SIM is indicated by MarkSu (non-future form) + ∅. Nobonob employs six different sets of MarkSu to distinguish the categories SS.SEQ, SS.SIM, DS.SEQ.REALIS, DS.SEQ.IRREALIS, DS.SIM.REALIS and DS.SIM.IRREALIS. Amele employs a combination of means to indicate the SEQ/SIM distinction. SS.SEQ is indicated by the morpheme *-me* and DS.SEQ is indicated by the morpheme *-ʔV*, where *V* is a harmonic vowel. SS.SIM, DS.SIM.REALIS and DS.SIM.IRREALIS, on the other hand, are indicated by particular sets of MarkSu.

There were also found to be further sub-divisions of the SEQ and SIM categories. A number of languages mark SEQ events as either occurring in immediate sequence (contiguous) or not (non-contiguous). In Mianmin, Fasu, Ambulas, Angaataha, Kunimaipa, Koiari and Nasioi this distinction is marked. Some languages also further divide the SEQ.NONCONT(iguous) category into 'later' and 'much later'. Barai does this (see Foley 1986:180) as does Telefol. There was one language in the sample that appears to have a unique distinction in the SEQ category. In Oksapmin a distinction is marked of SEQ.BEFORE versus SEQ.AFTER. Both these distinctions can be marked on SS or DS verbs. SEQ.BEFORE means that the event described by the marked verb occurred before the event described by the following verb. SEQ.AFTER means that the event described by the marked verb occurred after the event described by the following verb. This distinction is illustrated by (20a). In (20b) the meanings of the undefined abbreviations are CONTIN(uous action), A(gent's)-V(iewpoint) and IMM(ediate)P(ast tense).

(20)a. *Ko-ri-paat tohwaan suhun mi-∅-ha-ngop.*
arrive-CONTIN-SS.SEQ.**BEFORE**.S sweet.potato dug put.in-CONTIN.AV-IMMP.S
After he arrived he put the sweet potato he had dug into (his string bag).

b. *Ko-ri-ham tohwaan suhun mi-∅-ha-ngop.*
arrive-CONTIN-SS.SEQ.**AFTER**.S sweet.potato dug put.in-CONTIN.AV-IMMP.S
Before he arrived he put the sweet potato he had dug into (his string bag). (Oksapmin)

So the SEQ category can be broken down into various subcategories as illustrated in Figure 3. The first distinction is between E-before-R and E-after-R, where E-before-R means that the event described by the marked verb, i.e. the E(vent described), occurred before the event described by the following verb, i.e. the R(eference event), and E-after-R means that

the event described by the marked verb (E) occurred after the event described by the following verb (R). This distinction was only marked overtly in the Oksapmin language isolate and does not subdivide further. However, the E-before-R distinction can be further divided into CONTIG(uous) versus NONCONTIG(uous), and the NONCONTIG category can be divided into 'later' and 'much later'.

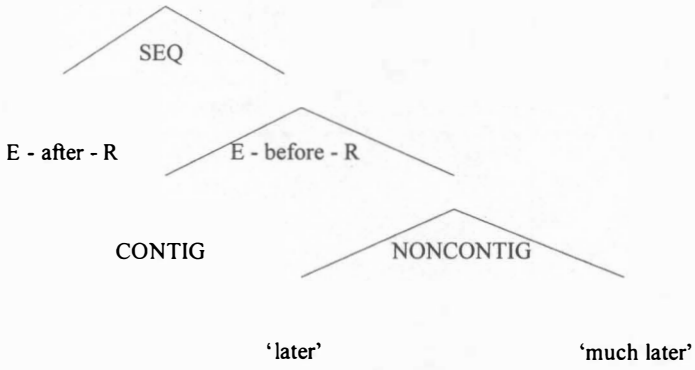


FIGURE 3: SEQUENTIAL SUBCATEGORIES

Most of the subdivisions under the SIM category are dealt with in the following section on durative and punctual aspect. As pointed out by Foley (1986:182), Iatmul marks a distinction between SIM.CAUSAL versus SIM.NONCAUSAL. However, no other language in the survey was found to mark this distinction in the SIM medial verb, which is presumably unique to Iatmul. In fact, it would seem to be more the norm that causative is associated with the SEQ category. For example, in a number of languages it is possible to have expressions with a structure like: *X did-SEQ.DS to Y and Y did*, as in the Amele example (21).

(21) *Uqa od-i-te-ce-b* *asal-ig-a.*
3SG do-PRED-1SG.DO-DS.SEQ-3SG laugh-1SG-TODP
She made me laugh. (Amele)

Another language that has an interesting variation on the SEQ versus SIM distinction is Suena. In Suena, whereas the SS verb has particular morphemes for expressing SEQ and SIM, the DS forms employ tense sequencing to express these notions. Suena has six tenses that can be marked on the final independent verb: present, today's past, yesterday's past, past (within the previous two years), remote past (prior to the previous two years), and future tense. Tense can also be marked on the DS medial verb but is restricted to the present, today's past, remote past and future tenses. These tenses can occur in combination on the DS medial verb and final verb to express the notions SEQ and SIM. This is illustrated in Table 13.

TABLE 13: SUENA TENSE SEQUENCING

	DS-Medial Verb Tense	Final Verb Tense
SEQ	remote past	remote past
	today's past	past (two years) yesterday's past today's past present
	future	future
SIM	present	remote past past (two years) yesterday's past today's past present future

The tense on the DS medial verb is neutralised with respect to its absolute meaning and instead expresses a relative tense notion with respect to the tense on the final verb. The sentences in (22)-(23) illustrate this function.

(22) *Na ge ses-e-n-a bamu-s-i-a.* (TODP + REMP = SEQ)
1SG talk say-TODP-1SG-IND go-REMP-3SG-IND
When I spoke he left.

(23) *Gi pupi-no-n-a pu bam-Ø-i-a.* (PRES + TODP = SIM)
spear get-PRES-1SG-IND pig go-TODP-3SG-IND
While I was getting my spear the pig went away. (Suena)

4.2 DUR/PUNC (APPENDIX 2, COLUMN 2)

Another common category marked on the SS/DS medial verb is that of DURATIVE (DUR)(ative) versus PUNCTUAL (PUNC)(tual) aspect, where durative means that an event lasts for a certain period of time and punctual means it does not, i.e. the event is momentary. This distinction occurs in 22 of the languages overall and is a particular feature in the languages of the Finisterre-Huon stock (McElhanon 1975), i.e. the West Huon, East Huon, Erap, Wantoat, Gusap-Mot, Yupna, Uruwa, Angan, Kunimaipa and Binanderean language families, which are located on either side of the Huon Gulf in Morobe and Oro Provinces respectively. In all of the Huon languages except Selepet it is the durative category that is marked and punctual is unmarked or marked with Ø. Example (24a)-(24c) shows a typical verb from Kâte where DUR is marked by *-ku*, SIM is marked by *-ha* and PUNC and SEQ are marked by the absence of these morphemes.

(24)a. *kpa-Ø-ku-ha-pe-ne ...*
kill-3SG.O-DUR-SIM-1-P.DS
as we were killing it ...

b. *kpa-Ø-Ø-ha-pe-ne* ...
kill-3SG.O-PUNC-SIM-1-P.DS
as we killed it ...

c. *kpa-Ø-Ø-Ø-pe-ne* ...
kill-3SG.O-PUNC-SEQ-1-P.DS
we killed it and ... (Kâte)

The Binandarean languages and other languages that have DUR versus PUNC aspect mark both categories. In Suena a distinction is also made between DUR.EXT(ended) versus DUR.SHORT, i.e. an event that lasts for a long period of time versus an event that lasts for a short period of time. In this language this is marked differently from PUNC. The semantic differences marked in the PUNC versus DUR domain are illustrated in Figure 4. Notice that it is always the temporal quality of the marked verb that is indicated and never the temporal quality of the controlling verb.

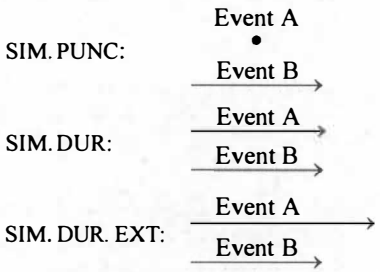


FIGURE 4: PUNCTUAL VERSUS DURATIVE DISTINCTIONS

In a few descriptions the terms PROG(ressive) versus NONPROG(ressive) aspect are used instead of DUR versus PUNC. Progressive aspect is normally used to describe a meaning that has more than just duration over time as a component. For example, a number of linguists define PROG as a combination of durative and non-stative meaning, cf. Lyons (1968:315), Comrie (1976:35), Quirk, et al. (1985:198) and Dahl (1985:91). So it would not be expected that a PROG form could be marked on a stative verb. This simple diagnostic can therefore be used in a given language to test whether the marked category is PROG or DUR. As an illustration, Amele is a language outside of the Finisterre-Huon stock that marks a DUR/PUNC distinction on the medial SIM verb. In this language when the event described by the marked verb is durative in relation to another event the verb is reduplicated, usually the first CV of the verb stem. But when the event is punctual in relation to another event the verb is not reduplicated. This marking is exemplified by (25a)-(25b).

(25)a. *Age ho-ho-gin j-oq-a.*
3PL **DUR**-come-3PL.SIM.DS eat-1PL-TODP
While they came we ate.

b. *Age Ø-ho-gin j-oq-a.*
3PL **PUNC**-come-3PL.SIM.DS eat-1PL-TODP
When they came we ate. (Amele)

The evidence that the category marked by the reduplication is DUR and not PROG is that this reduplication can occur on any verb including stative verbs such as *bilec* 'sit, be', *nijec* 'lie, be' or *tawec* 'stand, be'. In (26), for example, the stative verb *nijec* 'be' is reduplicated and has the simple meaning that the activity of 'dancing' extended over a time period while the action described by the following verb occurred.

(26) *Uqa due du-du-i ni-nij-en ale bel-esin.*
3SG dance DUR-dance-PRED DUR-lie-3SG.SIM.DS 3DU go-3DU.REMP
While he danced they (two) left. (Amele)

The fact that *bilec* 'sit, be', *nijec* 'lie, be' and *tawec* 'stand, be' are actually stative verbs can also be demonstrated. There is another type of reduplication in the verbs whereby the whole verb stem is reduplicated by rightward formation. This indicates iterative action. Iterative is another category that cannot be combined with stative (cf. for example Bybee 1985:150). When these stative verbs in Amele are marked for iterativity they can only have their non-stative meaning, whereas when they are marked for durativity they can have either their stative or non-stative meaning. This is illustrated in Table 14.

TABLE 14: DURATIVE AND ITERATIVE FORMS OF STATIVE VERBS IN AMELE

bil-ec	to sit, to be	*bi-bil-en*	while he sits ..., while he is ...	*bili-bili-ec*	to sit repeatedly
nij-ec	to lie, to be	*ni-nij-en*	while he lies ..., while he is ...	*niji-niji-ec*	to lie repeatedly
taw-ec	to stand, to be	*ta-taw-en*	while he stands ..., while he is ...	*tawi-tawi-ec*	to stand repeatedly

The three languages that were described as having a PROG versus NONPROG distinction marked on the SS/DS medial verb are indicated accordingly in Appendix 2. In the case of Gahuku there would appear to be some question as to whether the category described is PROG or DUR since, while Deibler (1976:13) defines PROG in Gahuku as indicating "an action currently in progress," he notes that PROG can be marked on the stative verb 'to be'. In Nankina, on the other hand, the SS/DS medial verb can be independently marked for all the categories of SEQ, SIM, DUR and PROG, as in (27) for example.

(27) *Nin wo kap jipM-rˈpM-gwiʌŋ-N-ku yaka pʌ-nam.*
1PL go.up possum kill-PROG-DUR-SS-SEQ again come.down-FUT.1PL
We will go up and kill possums for a while and then come down again.(Nankina)

4.3 TENSE (APPENDIX 2, COLUMN 3)

In a number of languages the DS medial verb is morphologically the same as or very similar to the final verb for the category of tense. Therefore for these languages the categories of absolute tense, such as past, present and future tense, that are marked on the final verb, can also be marked on the DS medial verb. This is the case, for example, with Binandere, Daga, Enga, Fore, Koita, Washkuk, and Zia. For many languages, however, the tense distinctions marked on the medial verb are reduced or neutralised in some way from

the categories as found on the final verb. For example, in the Erima language (Colburn 1981) there are distinctive sets of MarkSu markers for the four final verb tense categories of present, yesterday's past, remote past and future tense. However, the medial SS/DS verbs show fewer tense contrasts. In the DS medial verb there is a three-way distinction marked of 'past', 'present', and 'future'. The DS.PAST concords with remote past tense on the final verb; the DS.PRESENT concords with present and yesterday's past on the final verb; and the DS.FUTURE concords with future tense on the final verb. In the SS medial verb, however, there is just a two-way distinction 'future' versus 'non-future', and this is optional for the SS medial verb. The Erima system and forms are displayed in Figure 5.

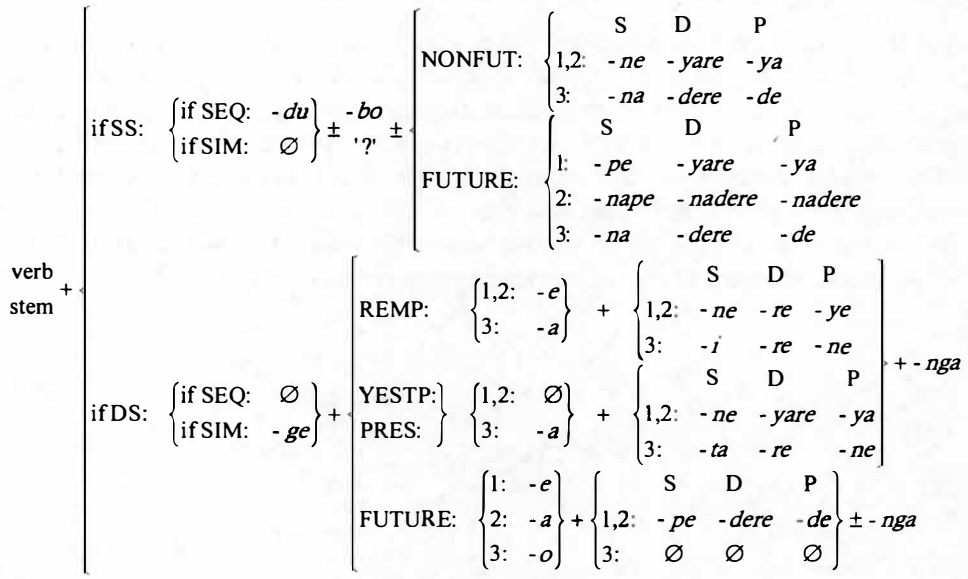


FIGURE 5: ERIMA MEDIAL VERB TENSE MARKING

In Wahgi (Philips 1976), on the other hand, this kind of medial verb tense neutralisation has a slightly different twist. Wahgi has the final verb tense categories remote past, immediate past (which includes today and yesterday), present and future. The medial verb is marked for what may be termed a past versus non-past distinction. However, the final verb category immediate past tense can co-occur with either the past or non-past medial verb form depending on the context, as illustrated in Table 15.

TABLE 15: CO-OCCURRENCE OF WAHGI MEDIAL AND FINAL VERB TENSE CATEGORIES

	Medial verb tense categories:	
Final verb tense categories:	PAST	NONPAST
Remote past	X	
Immediate past (yesterday-today)	X	X
Present		X
Future		X

Another language that is cited as having a past versus non-past distinction marked on the medial SS/DS verb is Koromu (Priestly 1980, 1986). The most common neutralisation of tense distinctions in Papuan medial verbs, however, would appear to be a future versus non-future distinction. This is probably because of the more basic epistemological difference between relating future and non-future events. In fact, a number of Papuan languages are cited in the literature as having a future versus non-future distinction marked on the medial verb. For example, Kapau (Oates and Oates 1968), another Angan language, has six tenses marked on the final verb: present, today's past, yesterday's past, remote past, historical past, and future tense. However, these tense distinctions are neutralised in the medial SS/DS verbs. The medial DS verb neutralises to just a past, present and future distinction and the medial SS verb neutralises to just a future versus non-future distinction.

For a few of these languages the future versus non-future distinction marked on the medial SS/DS verb is purely one of tense; the future tense marking on the medial verb can only co-occur with a verb final future tense marking. It is not possible in these cases for a future oriented modality, such as imperative mood, to occur on the final verb in concord with the medial future form. For example, Tauya (MacDonald 1983) has such a future versus non-future tense distinction marked on the SS/DS medial verb, as illustrated in Figure 6. In Tauya the MarkSu on the DS medial verb is the same form as that on the final verb. What distinguishes them as DS medial verbs are the suffixes *-te*, *-fe*, *-tefe*.

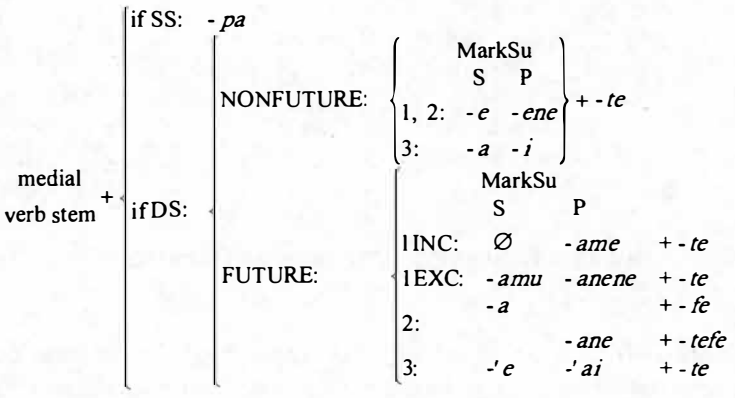


FIGURE 6: TAUYA MEDIAL VERB TENSE MARKING

MacDonald (1983:116-117) reports that the SS medial verbs are not marked overtly for tense. If the final verb is aorist (non-future) tense a preceding SS medial verb is interpreted as being aorist. If the final verb is future tense, the preceding SS medial verb is interpreted as also being future tense. This is illustrated by (28a)-(28b). The meaning of the undefined abbreviation is ERG(ative).

(28)a. *Ne-ne fofe-pa ya-tu-a-'a.*
3SG-ERG come-SS 1SG.O-give-3SG-IND
He came and gave (it) to me.

b. *Ne-ne fofe-pa ya-tu-'e-'a.*
3SG-ERG come-SS 1SG.O-give-3SG.FUT-IND
He will come and give (it) to me. (Tauya)

DS medial verbs, on the other hand, are marked for tense. Those with non-second person subjects are only marked for the aorist (non-future) tense and those with second person subjects can only be marked for future tense. In both cases, however, the tense marked on the medial verb is neutralised and the medial verb is interpreted as being in the tense of the final verb, as illustrated by (29a)-(29b) and (30a)-(30b).

(29)a. *Ne fofe-a-te Ø-tu-e-'a.*
3SG come-3SG.AORIST-DS 3SG-give-1/2SG.AORIST-IND
He came and I gave it to him.

b. *Ne fofe-a-te Ø-tu-amu-'a.*
3SG come-3SG.AORIST-DS 3SG-give-1SG.FUT-IND
He will come and I will give it to him. (Tauya)

(30)a. *Na momune-a-fe ya-ne pofei-ti na-tu-e-'a.*
2SG sit-2SG.FUT-DS 1SG-ERG talk-CONJ 2SG-give-1/2SG.AORIST-IND
You sat and I talked to you.

b. *Na momune-a-fe ya-ne pofei-ti na-tu-amu-'a.*
2SG sit-2SG.FUT-DS 1SG-ERG talk-CONJ 2SG-give-1SG.FUT-IND
You will sit and I will talk to you. (Tauya)

In Yagaria too (Renck 1975), there is a distinction marked in the DS medial verb between future versus non-future, as illustrated in Figure 7. The *-s* 'future' marker only occurs with a final verb marked for the intentional future or regular future tense. Other tenses marked on the final verb are past and present. The medial imperative form occurs with a final imperative or future form. The medial imperative form is the same as the final form except that in the final form there is also a verb final particle *-o*. So in Yagaria, as in Tauya, the future versus non-future distinction marked on the medial verb is purely one of tense since imperative mood on the final verb does not concord with future tense on the medial verb.

$$\begin{Bmatrix}\text{if SEQ: } Ø\\ \text{if SIM: } no\text{-}\end{Bmatrix} + \begin{matrix}\text{medial}\\ \text{verb}\\ \text{stem}\end{matrix} + \left[\begin{array}{ll} \text{if SS:} & \begin{Bmatrix}\text{COMP: } \text{-}lo\\ \text{PERF: } \text{-}du\\ \text{LOC: } \text{-}li\end{Bmatrix} + \text{MarkSu}\\ \text{if DS:} & \begin{Bmatrix}\text{PAST / PERFECTIVE: } \text{-}d\\ \text{FUTURE: } \text{-}s\\ \text{IMP: } Ø\end{Bmatrix} + \text{MarkSu} + \text{-}(a)ga + \text{AnticSu}\end{array}\right.$$

FIGURE 7: YAGARIA MEDIAL VERB TENSE MARKING

A number of other languages are also cited as having a future versus non-future distinction marked on the medial SS/DS verb, i.e. Gende (Aufenanger 1952), Kamano (Drew and Payne 1969), Awa (Loving 1973), Boiken (Freudenberg 1979), Botin (Pryor and Farr 1989), Samo (Shaw 1973), Barai (Olson 1973, 1975, 1978, 1981), and Tairora (McKaughan 1966). However, in each of these cases it is not clear from the descriptions given exactly

what final verb categories co-occur with the medial verb future and non-future distinctions. So it is not possible to determine for these languages whether the 'future' distinction is purely one of tense or whether it is a modal distinction.

Comrie (1985:43-48) points out that with a future versus non-future tense distinction the question arises as to whether this is still a tense distinction or has become a modal distinction of irrealis versus realis modality. The way to test this for these languages would be to see if the future tense form could occur with final verb modal categories such as imperative or counterfactual mood. If this were the case then the so-called 'future tense' would actually be irrealis modality. In fact, for a number of languages with such a future versus non-future distinction marked on the SS/DS medial verb the 'future' medial category can occur with verb final modal categories (see §4.4 below).

4.4 REAL/IRR (APPENDIX 2, COLUMN 4)

As described in Roberts (1990, 1992a, 1994) some Papuan languages clearly mark a simple binary distinction of R(ealis) versus IRR(ealis) modality on the SS or DS medial verb. In Amele, for example, the realis versus irrealis distinction is marked by different sets of MarkSu on the DS.SIM medial verb. The realis DS.SIM medial verb occurs only with realis final verbs marked for present tense or any of the past tenses, while the irrealis DS.SIM verb occurs only with irrealis final verbs marked for any future tense or imperative, hortative, prohibitive, counterfactual or apprehensive mood. This is illustrated by (31a)-(31b). The final verb forms for today's past tense and imperative mood happen to be identical in Amele but the modal distinction is marked on the DS.SIM medial verb.

(31)a. *Ho bu-busal-en age qo-ig-a.* (REALIS)
pig DUR-run.out-3SG.SIM.DS.**R** 3PL hit-3PL-TODP
They killed the pig as it ran out.

b. *Ho bu-busal-eb age qo-ig-a.* (IRREALIS)
pig DUR-run.out-3SG.SIM.DS.**IR** 3PL hit-3PL-IMP
Kill the pig as it runs out. (Amele)

A number of other languages resemble Amele in marking a realis versus irrealis distinction on the SS/DS medial verb. For example, Colburn (1981) for Erima gives a number of examples of 'future tense' medial forms occurring with verb final imperative forms. The verb final imperative form is marked with *-wa≈-a*. These examples are given in (32a)-(32b).

(32)a. *Yapa-∅-bo-nape ny-a-u!*
sit-SIM-?-2SG.FUT.SS eat-IMP-2SG
While you sit eat!

b. *Yapa-du-bo-nape ny-a-u!*
sit-SEQ-?-2SG.FUT.SS eat-IMP-2SG
After you sit eat! (Erima)

Gahuku (Deiber 1976) is another language that marks future on the medial verb in concord with imperative mood on the final verb as given in (33).

(33) *Ho NO-it-i-KO ano.*
sun PROG-rise-3SG-DS.FUT come.IMP
Come as the sun is rising. (Gahuku)

Ambulas (Wilson 1980) is another language with a marking on the SS/DS medial verb described as 'future tense' which turns out to have a modal context. In Ambulas the SS and DS verbs can be marked for the categories of SEQ and SIM. The DS verb can also be marked with the future suffix *-u≈-o* which Wilson (1980:73-74) says can occur in either a future tense, desiderative tense, or imperative mood context. Some examples are given in (34)-(36). The meanings of the undefined abbreviations are: BEN(efactive) and DES(iderative).

(34) *Kéraa-n-o yé-ké dé y-o.*
get-1PL-DS.FUT go-FUT 3SG do-PRES
We will get and he will go.

(35) *Akélak mé ra-n-o.*
quietly IMP sit-1PL-DS.FUT
We will sit quietly.

(36) *Vi nak mé yé gi-kwe-mén-u dawuli r-e sayéké*
spear one IMP go tie-3SG.BEN-2SG-DS.FUT go.down sit-SS cassowary
viyaa-tiyaa-d-u baak-ne ka-ké wuné-k.
strike-1SG.BEN-3SG-DS.FUT steam-SS eat-DES 1SG-DES
You go and make a spear for him and let him go down and sit and kill the cassowary and let me steam-cook and eat (it). (Ambulas)

Angaataha (Huisman 1973) is also reported to have a non-future versus future distinction marked in the medial DS verb. This is indicated by *-one* 'non-future' and *-ane* 'future'. Huisman does not give any data which would indicate directly whether the 'future' medial form can co-occur or not with a modal final form, such as imperative or desiderative mood. However, since the verb final future tense and desiderative mood are neutralised into one form this would indicate that final future tense itself has modal contexts. Examples are given in (37a)-(37b).

(37)a. *Tehoáah-one-hé nanatáisée.* (REALIS)
I.make.fire-**SIM.R**-DS he.is.eating
While I am making a fire he is eating.

b. *Tehoáas-ane-hé nantáisée.* (IRREALIS)
I.make.fire-**SIM.IR**-DS he.will.eat
When I make a fire he will eat. (Angaataha)

Nobonob (Aeschliman 1988) is another Papuan language that makes a basic realis versus irrealis distinction in the medial verb. In this case the distinction is marked on both the SEQ and SIM DS medial verbs by different sets of MarkSu markers (see Table 7). In Nobonob the final verb forms that co-occur with the realis medial verb are present, past and habitual past tense. The final verb forms that co-occur with the irrealis medial verb are future (both positive and negative) and certain negative future tense and imperative and counterfactual mood. Examples are given in (38a)-(38b) and (39a)-(39c).

(38)a. *Ah ag e he-egeg danab age lag qag-teb.* (REALIS)
woman 3PL food do-3PL.DS.SIM.**R** man 3PL house tie-3PL.PRES
As the women cook the food the men are roofing the house.

b. *Ah ag e he-egeg danab age lag qag-pig.*
woman 3PL food do-3PL.DS.SIM.**R** man 3PL house tie-3PL.PAST
As the women cooked the food the men roofed the house. (Nobonob)

(39)a. *Ah ag e he-bepeg danab age lag qag-kulag.* (IRREALIS)
woman 3PL food do-3PL.DS.SIM.**IR** man 3PL house tie-3PL.FUT
As the women cook the food the men will roof the house.

b. *Ba me-d̲aa-pe la-i.*
betelnut give-1SG.O-DS.SEQ.**IR** eat-1SG.IMP
Give me betelnut to eat.

c. *A go-ped̲ ag e me-ta-lob.*
2DU go-2DU.DS.SEQ.IR 3PL food give-2DU-3PL.CONTR
You (two) could have gone and they would have given you (two) food. (Nobonob)

Another language that makes a realis versus irrealis distinction in the medial verb is Anjam (Rucker 1983). In Anjam the realis versus irrealis distinction is marked on both SEQ and SIM, SS and DS medial verbs by different sets of MarkSu agreement markers and, in the case of the SIM.DS verb, by different realis–irrealis morphemes. The final verb forms that co-occur. with the realis medial verb are present, immediate past and remote past tense and the final verb forms that co-occur with the irrealis medial verb are future tense, and imperative and counterfactual mood. Examples are given in (40)-(42).

(40) *E tabir yans-eqn-a-m Rut alaŋ-oqn-e-j.* (REALIS)
1SG dishes wash-SIM.R-REM.P-1SG.**R**.DS Ruth play-CONT-REM.P-3SG
While I washed the dishes Ruth played. (Anjam)

(41) *A wan-oqn-i-m naŋgi b-q-ab.* (IRREALIS)
3SG work-SIM.IR-FUT-3SG.**IR**.DS 3PL come-FUT-3PL
He will be working when they come. (Anjam)

(42) *E ino bem qoit-et-i-t ni uy-e.*
1SG your bread bake-BEN-FUT-1SG.**IR**.DS 2SG eat-IMP
When I bake your bread for you, you eat. (Anjam)

Another language that marks a realis versus irrealis distinction on the medial verb is Wojokeso (West 1973). West describes the distinction on Wojokeso medial verbs as non-future versus future tense but since some of the categories under future tense such as 'unrealised subjunctive' (counterfactual) are clearly not related to future time reference the distinction is realis versus irrealis modality. The realis versus irrealis distinction on the medial verb in Wojokeso is indicated by different sets of MarkSu agreement markers.

Bargam (Hepner 1986) also has a realis versus irrealis distinction marked on the medial verb. In this case the markers are invariable and there are two separate sets of markers for SS and DS which additionally indicate the categories of SEQ, SIM and IRR. This is illustrated in Figure 8.

verb stem +		SEQ	SIM	IRR
	if SS:	*-im*	*-ad*	*-eq*
	if DS:	*-an*	*-sa*	*-id*

FIGURE 8: BARGAM SS/DS MARKERS

Bargam also has four tense distinctions marked on the final verb: present, past, habitual past and future. The interesting feature of this language, however, is that the habitual past is categorised as irrealis modality rather than realis modality. Examples are given in (43)-(44).

(43) *I bul hunog-eq wiz-eq tital-eq oy-eq i neqam.*
1PL pig spear-SS.IR singe-SS.IR butcher-SS.IR cook-SS.IR 1PL eat.FUT.1PL
We will spear the pig, singe, butcher and cook it, then eat it. (Bargam)

(44) *Mileq-eq leh-id teq anamren aholwaq-ad in didaq tu-ugiaq.*
return-SS.IR go-DS.IR then owner see-SS.SIM 3SG food PFV-give.HABP.3SG
When (the pig) would return and go then the owner, on seeing it, used to give it food. (Bargam)

Another language that is reported to code HABP as irrealis is Nek (Linnasalo, 1990). In Nek HABP and irrealis are both marked on the verb to indicate counterfactual mood, as illustrated in (45). The meaning of the undefined abbreviation is CAUS(ative).

(45) *Nindi dänägän wi tike-na-m dä-win miti plon pa-ka-ne-ŋ.*
1PLF earlier that take-1PL.DS.IR-CAUS COND-that worship on stay-HABP-IR-1PL
If we had taken it earlier that worship (practise) would have stayed. (Nek)

The pattern of irrealis marking that emerges is as displayed in Table 16. For some languages, namely Tauya and Yagaria, the future tense as marked on the medial verb is a pure future tense and is not used in modal contexts. There are then other languages where the future tense has been grouped with other modal categories via the medial verb classification. In the first of these groupings are Erima, Gahuku, Angaataha and Ambulas, where future time oriented modalities such as imperative and desiderative are grouped with the future tense proper. In the next group are Amele, Nobonob, Anjam and Wojokeso, where the development of the 'future' medial verb category is taken a step further. In these languages a non-future time oriented modality such as counterfactuality is also grouped with future tense and imperative mood. Finally, there are the Bargam and Nek languages where past habitual on the final verb is also classified as a modality[7] by the medial verb desinence.

7 Comrie (1985:404-41) maintains that under his definition of tense, while habituality can be viewed as an aspectual or modal category, it cannot be viewed as a tense category.

TABLE 16: THE IRREALIS CATEGORY GROUPINGS OF PAPUAN MEDIAL VERBS

TENSE →	MODALITY →	→	→
+future tense	+future tense +imperative mood	+future tense +imperative mood +counterfactual mood	+future tense +imperative mood +counterfactual mood +past habitual
Tauya Yagaria (DS)	Erima (SS) Gahuku Angaataha Ambulas (DS)	Amele (DS) Nobonob Anjam Wojokeso	Bargam Nek

4.5 PURPOSE (APPENDIX 2, COLUMN 5)

In a few languages it is possible to mark PURP(ose) on the SS/DS medial verb. This was found to be the case for Fasu, Agarabi, Usan, Kobon, Ömie and Tauade. In Agarabi and Kobon PURP is only marked on the SS medial verb, while in Fasu, Usan, Ömie and Tauade PURP can be marked on both the SS and DS medial verb.

In Agarabi SS is indicated by MarkSu, which is a reduced form of the verb final MarkSu, namely *-h* 'first person', ∅ 'second person' and *-n* 'third person'. DS is indicated by the addition of AnticSu morphology. The SS verb can be additionally marked with *-nto* 'purpose', as in (46).

(46) *Wé ánkáán óri-nto-n úhtaa-iyaa-m-íh.*
3PL all go-**PURP**-3.SS prepare-CONT-IND-3PL.FINAL
They all prepared to go. (Agarabi)

In Kobon PURP can be marked on the SS medial verb by the suffix *-nig*, which replaces the SS morphology, as in (47). However, when the purpose clause involves a different subject, as in (48), it is marked as a final verb. Recall that in Kobon, in accord with the 'regular' SS/DS system, the SS versus DS distinction is marked by different sets of MarkSu. But in the PURP SS/DS marking the SS category is coded by an invariable suffix and the DS category is coded by MarkSu. The meaning of the undefined abbreviation in (47)-(48) is P(er)F(e)CT aspect.

(47) *Nipe ñimagö rib-öm balus aram-öm dokta nöŋ-nig igid*
3SG hand cut-3SG.SS plane go-3SG.SS doctor perceive-**PURP.SS** quickly
ar-öp Kusip.
go-PFCT.3SG Kusip
Because he had cut his hand he quickly went by plane to Kujip to see the doctor. (Kobon)

(48) *Nipe nagi ud-öm hagape au-ag-aŋ a g-öm ñimagö*
3SG vine take-3SG.SS blood come-NEG-3SG.IMP say do-3SG.SS hand
wam-öb.
bind-3SG.PFCT
He bound his hand with a vine so that the blood would not come. (Kobon)

In Fasu, as illustrated previously under §2.2.4, a range of categories is distinguished for the SS and DS medial verbs. One distinction made for SS and DS is that of purpose. In (49) PURP.SS is marked by *hoko* and in (50) PURP.DS is marked by *simo*. The meaning of the undefined abbreviation in (49)-(50) is DECL(arative mood).

(49) *Some-hoko pe-sa-po.*
talk-**PURP.SS** come-PAST-DECL
I came to talk. (Fasu)

(50) *Na-simo aipa moto-sa-po.*
eat-**PURP.DS** sago put-PAST-DECL
I put the sago for (the pig) to eat. (Fasu)

Another distinction that is made in the SS/DS verb in Fasu is what Loeweke and May (1980:55ff.) term "negative purpose" which translates into English as 'lest' or 'for fear that'. Examples are given in (51)-(52).

(51) *Kerere mara-paka pari-sa-po.*
trouble get-**LEST.SS** remain-PAST-DECL
Lest I got into trouble, I stayed (here). (Fasu)

(52) *E pe-akohoamo ano tau pu-sua-po.*
3SG come-**LEST.DS** 1SG secretly go-PAST-DECL
Lest he come, I secretly went. (Fasu)

Another language that marks PURP.SS/DS is Usan. Reesink (1987) says that in Usan not all SS/DS medial verb forms are devoid of tense indication and derive their tense from the first following final verb. He says,

> There is also a set of future medial forms. They signal that the time of the state of affairs they express is projected forward from the time determined by the first following final verb (Reesink 1987:88).

So what these "future" medial forms in Usan express is the notion of intention or purpose, as illustrated by (53)-(54). The meaning of the undefined abbreviation in (53)-(54) is F(ar)P(ast tense).

(53) *Ani-mbege-ib qâmb di-aum.*
you.P.O-see-**S.FUT.SS** say.SS come.up-1SG.PRES
I have come up to see you. (Usan)

(54) *Wuri uru uyo-ub-ari ne ye nob ir-amei.*
they dance sway-**FUT**-3PL.DS and I with ascend-1SG.FP
They were going to dance and I went up with them. (Usan)

Ömie is another language that can mark PURP.SS and PURP.DS distinctively. Austing and Austing (1977) describe several types of subordinate clause in Ömie. In one type the verb can be marked with *-go* which indicates a change of subject between the subordinate clause and the main clause. When the *-go* occurs on its own it expresses purpose, as in (55). However, when the *-go* occurs with the subordinating conjunction *ëhuni* then the subordinated clause can have a purpose or reason interpretation depending on the context, as in (56). When the suffix *-ëro≈-ëni* occurs on the verb this indicates PURP.SS, as in (57).

(55) *Na ie ujuoho rue-ˈejô nô i-ˈiröhe-go.*
1SG food bring will-come.FUT.1SG 1PL eat-FUT.1PL-**PURP.DS**
I will bring food for us to eat. (Ömie)

(56) *Anago-röhe-go ëhuni naˈô vaˈe.*
hurt-2SG.FUT-DS REASON 1SG.also go
I am going with you because they will hurt you. (Ömie)

(57) *Mahe bijioho-ˈiröd-ëni baej-ôde höjo.*
pig spear-1SG.FUT-**PURP.SS** take-PAST.1SG AUX
It was to spear pigs that I took it. (Ömie)

There are also several markers in Ömie which distinguish the notion of immediate purpose. The suffix *-irô* marks IMM.PURP.SS, as in (58), and the suffix *-jöro* marks IMM.PURP.DS or REASON, as in (59).

(58) *Na ie iˈ-irô rôve.*
1SG food eat-**IMM.PURP.SS** come
I have come to eat. (Ömie)

(59) *Mie aneho-jöro ëhuni huˈiraejëgo rôvôdeje.*
game kill.1SG.BEN-**IMM.PURP.DS** REASON bring.2SG come.1SG.PAST
It was so that you would kill game for me that I brought you. (Ömie)

It is also the case in Amele that the regular SS/DS verbs can function in a reason or purpose clause, depending on the context. The SS/DS medial verb is not marked inflectionally for reason or purpose as such; rather the postposition *nu* which can express 'reason' or 'purpose' is cliticised to the medial verb. In (60) the SS medial verb *jimig* functions in a subordinate purpose clause. Note also in (60) that the subject-NP in the purpose clause, *ija dih* 'just I', has been moved to the preverbal focus position for contrastive emphasis.

(60) *Qee sab ija dih ji-m-ig=nu umadu-he-ce-min od-og-a.*
not food 1SG just eat-SS-1SG=PURP make-2SG.DO-DS-1SG do-2SG-TODP
It was not just so that I could eat the food that I made you do that. (Amele)

In (61), on the other hand, the DS medial verb *jojoqon* functions in a subordinate reason clause, also marked with *nu*.

(61) *Nac-nac jo-jo-qon=nu saen cecelac odi bil-i-a.*
small-small DUR-eat-1PL.DS.SIM=REASON time long like sit-3SG-TODP
Because we have eaten (it) little by little it has lasted a long time. (Amele)

4.6 CONDITIONAL (APPENDIX 2, COLUMN 6)

Another category that is sometimes marked on the SS/DS medial verb is that of conditionality (COND). For the following languages it was noted that it is possible to mark COND on the medial verb form: Washkuk, Ambulas, Iatmul, Salt-Yui, Wahgi, Hua, Agarabi, Kosena, Awa, Usan, Bargam, Menya, Kunimaipa, Tauade, Koita, Barai, Akoye, Tainae and all the languages of the Gum family including Amele.

However, in some cases there was difficulty deciding whether COND was actually marked on the SS/DS medial verb or not. Haiman (1978), for example, in his classic article

arguing that in Hua protasis conditional clauses are topics, gives three different forms that may be translated as 'if he comes, I will stay'. His examples are given here as (62). Only (62a) has a medial verb marked for DS and while this could have a hypothetical interpretation the DS marking always indicates a causal succession across the clauses. In (62a) the DS clause is also in a coordinate relationship to the following clause since the tense and mood of the final clause applies to the DS clause. In (62b) the question particle *ve ≈pe*, which can also occur at the end of an independent clause, can function as a subordinator to produce a conditional-like clause. In (62c) the relativiser, *-ma*, also indicates that the protasis clause is subordinate to the following apodosis clause. The problem is this. Only (62b) and (62c) have overt markers for COND, and this is consistent with the fact that only in these cases is the first clause subordinated to the second clause. However, the overt DS markers only occur in (62a) which is not marked overtly for COND. So in Hua COND is marked on the medial verb-form in complementary distribution to SS/DS.

(62)a. *E-si-ga-da* *baigue.*
come-3SG.FUT-DS-1SG.ANTICSU stay.1SG.FUT
When he comes I will stay.

b. *E-si-ve* *baigue.*
come-3SG.FUT-Q stay.1SG.FUT
Will he come? (Yes) I will stay.

c. *E-si-ma-mo* *baigue.*
come-3SG.FUT-3SG.REL-COND stay.1SG.FUT
Given that he comes, I will stay. (Hua)

In a number of other languages COND is also marked in this way on the medial verb. Washkuk, for example, has a set of markers that indicate SS versus DS as well as indicating certain tense categories. These markers are also in complementary distribution to markers indicating hypothetical and counterfactual condition. This is illustrated in Figure 9.

medial verb stem +	SS:	SEQ:	*-chi*
		SIM:	*-niga*
	DS:	PAST:	*-rek*
		PRES:	*-wak*
		FUT:	*-nak*
	COND:		*-ne*
	CONTR:		*-yega*

FIGURE 9: WASHKUK MARKERS OF SS/DS AND CONDITIONALITY

The same situation obtains in Kunimaipa where the markers *-puho* 'SS' and *-na* 'DS' are in complementary distribution to *-tine* 'counterfactual'. Also in Barai the COND marker *-ne* occurs in complementary distribution to the SS marker *-na* and the DS marker *-ga≈-gana≈ -ke*. So in Hua, Washkuk, Kunimaipa and Barai it is not accurate to say that the categories COND/CONTR are marked on the SS/DS medial verb since, when COND is marked on the medial verb in these languages, SS versus DS is not indicated.

By way of comparison, with all of the categories examined so far, namely SEQ/SIM, DUR/PUNC, TENSE and REALIS/IRREALIS, it is usually the case that these categories are marked on the SS/DS medial verb either in addition to the SS/DS marking or they form a distinctive part of the SS/DS marking. Recall the Kâte example, (24), where the categories of DUR, SIM and DS can all be marked independently on the same verb. However, some languages do mark COND in conjunction with SS/DS. In Salt-Yui COND is indicated by the presence of the irrealis marker *-na*, as illustrated by (63).

(63) *ne-na-m-a* ...
eat-IRR-1SG.DS-COND
if I/we will eat ... (Salt-Yui)

Another language that has COND marked in the SS/DS medial verb as irrealis is Bargam. As illustrated previously in Figure 8, Bargam has two sets of SS and DS markers that indicate the categories of SEQ, SIM and IRR. When the IRR markers occur on the medial verb and the final verb is future tense the medial verb expresses conditionality. An example is given in (64). The meaning of the undefined abbreviation is LOC(ative).

(64) *Urom woq-id ya kabiy-ab a-hi lehedaiq.*
rain fall-IRR.DS 1SG garden-LOC ?-NEG go.FUT.1SG
If it rains I will not go to the garden. (Bargam)

Reesink (1987) reports that COND can be marked in Usan by the demonstrative pronoun *eng* 'the/that' and that this marking can occur on either final clauses or SS/DS medial clauses, as illustrated in (65)-(66). The undefined gloss is U(ncertain)F(uture). However, here the *eng* is not marked on the SS medial verb as such. Instead, this demonstrative marks the protasis clause.

(65) *Wau eâb igo-iner eng unor mâni utibâ.*
child cry.SS be-3SG.UF that(COND) mother yam give.3SG.3SG.DO.FUT
If the child is crying, his mother will give him yam. (Usan)

(66) *Yârâb eng ye-nipat qur big-âr.*
come.SS that(COND) 1SG.DO-step.over.SS money put-P.IMP
If you come, step over me and put your money (in the basket). (Usan)

There is, at least, one language that marks COND on the medial verb and fully integrates this category into the SS/DS system. This is Amele. In Amele there is a subordinating conjunction *fi* 'if' which can occur as a separate word-form in the protasis of a conditional sentence. In this case the protasis can be a final clause, which has a verb that is not marked for SS/DS, as in (67a), or it can be a medial clause marked for DS, as in (67b).

(67)a. *Age ho-qag-an=fi j-eq-an.*
they come-3PL-FUT=if eat-1PL-FUT
If they come we will eat.

b. *Age ho-co-bil=fi j-eq-an.*
they come-DS-3PL=if eat-1PL-FUT
If they come we will eat. (Amele)

When the protasis has a SS medial verb, however, the conditional conjunction, *fi* 'if', is incorporated into the verb and takes the place of the SS marker *-m(e)*, as illustrated by (67c).

c. *Ege h-u-f-eb j-eq-an.*
we come-PRED-SS.COND-1PL eat-1PL-FUT
If we come we will eat. (Amele)

The point of interest in Amele, however, is that the *fi* incorporation is more than just morphological. It is also semantic since it affects the SS/DS marking. The COND.SS marking can be used even when the subjects are not coreferential, as in (68). Here the speaker is indicating that the consequences of the condition will definitely be fulfilled if the condition is not met.

(68) *Qee ji he-du-f-eg qaga-h-ig-en.*
not eat(SS) finish-3SG.DO-COND.SS-2SG kill-2SG.DO-1SG-FUT
If you do not finish eating her I will kill you. (Amele)

The other languages of the Gum family also appear to mark the COND category with both SS and DS medial verbs. The COND markers are respectively: Sihan *-fe*, Bau *-fe*, Panim *-fe*, Gumalu *-fa*, and Isebe *-pe*.

4.7 REFERENTIAL OVERLAP OF PERSON AND NUMBER AND SS/DS MARKING (APPENDIX 2, COLUMN 7)

For some languages in the survey, a description was given of how the categories of person and number can influence the marking of SS/DS in these languages. Person and number can control what constitutes 'same subject' and what constitutes 'different subject' when there is referential overlap between the subjects of the marked and controlling clauses.

In some languages person and number do not control the SS/DS marking. For example in Alamblak, Angave, and Irumu the referential overlap is completely symmetrical, i.e. all instances of referential overlap are coded as SS. So if the subject of the marked clause is included in the subject of the controlling clause or if the subject of the controlling clause is included in the subject of the marked clause the marked clause is coded as SS. Irumu actually codes all cases of referential overlap with the SS+DS marking.

Some languages, on the other hand, are asymmetrical in the coding of referential overlap. With some of these languages it is number that controls the referential overlap. In these cases, if the subject of the marked clause is included in the subject of the controlling clause the marked clause is coded as DS, but if the subject of the controlling clause is included in the subject of the marked clause then SS is marked. Languages of this type are Amele, Ono and Suena.

In yet other cases referential overlap is controlled by person. In these languages SS is marked when the marked clause is first person, otherwise DS is marked. Such languages are Kewa, Nend and Waskia. Finally, there are some languages where referential overlap is controlled by both number and person. In these cases if the subject of the controlling clause is included in the subject of the marked clause or if the marked clause is first person then SS is marked, otherwise DS is marked. Languages of this type are Kobon and Usan. The foregoing is summarised in Table 17.

TABLE 17: PERSON AND NUMBER CONTROL OVER REFERENTIAL OVERLAP

Controlling category:		–PERSON –NUMBER	–PERSON +NUMBER	+PERSON –NUMBER		+PERSON +NUMBER	
Languages:		Alamblak Angave Irumu	Amele Ono Suena	Nend Waskia	Kewa	Kobon	Usan
Marked Control							
1PL	1SG	SS	SS	SS	SS/DS	SS	SS
1PL	2SG	SS	SS	DS	DS	SS	SS/DS
1PL	3SG	SS	SS	DS	DS	SS	SS/DS
1SG	1PL	SS	DS	SS	SS/DS	SS	SS
2SG	1PL	SS	DS	DS	DS	DS	DS
3SG	1PL	SS	DS	DS	DS	DS	DS

Note that the person control functions under the hierarchy

first person > non-first person

where first person has precedence for coreferential marking over non-first person. The number control also functions under the hierarchy

CONTROL ∈ MARKED > MARKED ∈ CONTROL

where inclusion of the referents in the controlling clause within the referents in the marked clause has precedence for coreferential marking over inclusion of the referents in the marked clause within the referents in the controlling clause. Another way of putting it would be to say that the referents in the controlling clause have precedence as the included set for coreferential marking.

Amongst the descriptions that had information on referential overlap no language was cited as marking DS in all cases of referential overlap. Although such a marking is logically possible it would seem unlikely that any language would not allow any referential discrepancy at all in SS marking.

4.8 SUMMARY DISCUSSION OF THE DATA IN APPENDIX 2

Of the categories that are commonly marked on SS/DS medial verbs the most ubiquitous is the SEQ versus SIM distinction. This occurred in over 60% of the languages with a SS/DS system. In each case the SEQ versus SIM distinction was only marked on the medial verb and not on the final verb. However, some languages, namely Dadibi, Bahinemo, Sanio, Golin, Sinasina and Rumu, were found to have medial verbs with a SEQ versus SIM distinction but no SS/DS system. This would therefore indicate that SEQ versus SIM is a feature of medial verbs rather than a feature of SS/DS systems. In corroboration of this it was also noted that the AN Bel languages, Takia, Gedaged and Bilbil, have developed medial verb systems with a SEQ versus SIM distinction under the external influence of the neighbouring Papuan languages but have not developed a SS/DS system. The Bel language, Dami, on the other hand has gone a stage further and developed a SS/DS system. Besides indicating that SEQ versus SIM are characteristic of medial verb systems rather than SS/DS systems it would also

indicate that a medial verb system (with or without the categories SEQ versus SIM) is prerequisite to a language developing a SS/DS system.

Both the SEQ and SIM categories broke down into various subcategories. SEQ broke down into E-before-R versus E-after-R, although this distinction was only marked in one language, Oksapmin. The E-before-R category broke down further into CONTIG versus NONCONTIG, and the NONCONTIG category could be also be divided into 'later' and 'much later'.

Another fairly common distinction found to be marked on SS/DS medial verbs was that of DUR versus PUNC aspect. This was actually determined to be a subset of the SIM category. The DUR versus PUNC distinction occurs as a particular feature of the languages of the Finisterre-Huon stock and the Binandarean languages. Since these language groupings are on opposite sides of the Huon Gulf it may well be an areal feature. However, this distinction was also found to occur in languages elsewhere, i.e. in Kapau (Angan), Daga (Dagan), Amele (Madang Province), Iatmul (East Sepik) and Nasioi (Bougainville). It was noted that DUR aspect has a different semantic component to PROG aspect and that in most cases it would appear to be the case that DUR is marked in the medial verb-forms of PNG languages rather than PROG. However, in one language, Nankina, both DUR and PROG can be marked on the SS/DS medial verb. The preference for analysing this category as DUR rather than PROG would lie in the fact that DUR can apply to states as well as to dynamic processes or events, whereas PROG cannot apply to states.

Other categories that could be marked on SS/DS medial verbs included absolute tense distinctions of past, present and future tense, realis versus irrealis modality, purpose and conditionality. All of these categories could also be marked on final verb forms but often it was found that the marking on the medial verb was different from that found on the final verb. For example, tense distinctions on the medial verb could be reduced or neutralised from the corresponding final verbs. So, whereas several degrees of past or future tense might be marked on the final verb, the corresponding medial verb would be marked for a simple trinary distinction of past, present and future. In some languages the tense distinctions marked on the medial verb were found to be reduced further to just a binary distinction of either past versus non-past or future versus non-future. The past versus non-past distinction was only found in Wahgi and Koromu, however. The future versus non-future distinction, on the other hand, was much more widespread and was recorded in at least fifteen languages. The binary distinction that apparently does not occur on SS/DS medial verbs is a present versus non-present distinction. Comrie (1985:50) has suggested a universal of tense systems; that the time reference of each tense is a continuity. A present versus non-present distinction would represent a discontinuous tense system and any instance would be a counter-example to this language universal.

It was also noted that the tense marking on SS/DS medial verbs is normally in concord or agreement with the tense marking found on the corresponding final verb. So the tense marked on a final verb applies backwards to all the clauses in the clause chain. Comrie (1985:102-107) distinguishes tense neutralisation from tense sequencing. In tense neutralisation one verb at the beginning of a string of verbs is marked for the tense to be expressed. The subsequent verbs in the string will either be unmarked for tense or will be marked by a single tense category which is neutralised by the tense category marked on the first verb in the string. So that in effect all the verbs in the string express the same tense category as the first verb. Comrie (1985:103) actually illustrates this phenomenon from Bahinemo, a Papuan language. An example from English would be *I will go to the shop and*

buy some bread. Future tense is only expressed overtly by the auxiliary *will* in conjunction with the first verb *go* but future tense also applies to the second verb in the string *buy*. So tense neutralisation can be characterised as a type of agreement operating across clauses at the same structural level. Tense sequencing, on the other hand, operates within a particular syntactic construction. In a given structure a particular tense will be required to be marked on a subsequent verb in a series in order to express the meaning. An example of tense sequencing in English would be in an indirect command, such as *I told him to eat his dinner*. Here the subsequent verb must be a *to* infinitive in order to express the indirect command. The crucial difference from tense neutralisation is that in tense sequencing the tense expression on the subsequent verb is usually different and independent from the tense expression on the first verb. Therefore tense sequencing can be characterised as a type of government where the tense-form of one verb in a given syntactic construction requires a particular tense-form of another verb which is structurally subordinate to it.

In PNG languages the most frequently occurring case is where tense is only marked on the final verb and not at all on the SS/DS medial verb. In Comrie's terms this would be a clear case of tense neutralisation, although here the controlling verb occurs at the end of the string instead of at the beginning as characterised by Comrie. Instances also occur where a tense is marked on the medial verb but here again it is a case of tense neutralisation since the marking on the medial verb expresses the same tense as that on the final verb. This tense expression may be identical on the medial verb or it may be more generalised from that expressed on the final verb, i.e. a particular degree of past tense on the final verb may be reduced to a 'general' past tense on the medial verb.

Tense sequencing does occur in PNG languages, however. It was noted that in Suena tenses can occur in serial combination to express the relative tense notions of sequential and simultaneous tense. To express simultaneity, for example, a verb marked for present tense must occur before a verb marked for any other tense.

In at least nine languages it was shown how the 'future' category marked on the SS/DS medial verb has been extended metonymically to include modal categories, such as imperative, desiderative and counterfactual mood and, in the case of Bargam and Nek, past habitual thus becoming the modal category of irrealis. In fact, only in two languages, Tauya and Yagaria, has the future versus non-future distinction remained purely one of tense.

There were two categories that could be marked on the SS/DS medial verb that clearly have a subordinate function, namely PURP and COND. In five languages the category of purpose could be marked on the SS/DS medial verb. In three languages PURP could be marked on either the SS or DS verb, and in two languages PURP could only be marked on the SS verb. In at least twenty languages the category of conditionality could be marked on the medial verb. It was illustrated from Hua, Washkuk, Kunimaipa and Barai, however, that in these languages the COND marker occurred in complementary distribution to the SS/DS markers. In one language, namely Amele, the COND marker *-fi* 'if' could be marked on both SS and DS medial verbs. The same also applied to the other five languages of the Gum family. In two languages, namely Salt-Yui and Bargam, COND was indicated on the SS/DS medial verb by an irrealis marker. While the incidence of PURP being marked on the SS/DS medial in PNG languages was somewhat less than that of COND it would appear to be the case that PURP, where it is marked, is more fully integrated into the SS/DS system than the category of COND.

It was also found that the categories of person and number can control the marking of SS and DS where there is referential overlap. Languages appear to manifest four basic patterns which can be summarised as follows:

(i) [–PERSON, –NUMBER]: neither person nor number control the SS/DS marking;

(ii) [+PERSON, –NUMBER]: person controls the SS/DS marking such that where both marked and controlling clauses have first person subjects then SS must be marked;

(iii) [–PERSON, +NUMBER]: number controls the SS/DS marking such that where the subject set of the controlling clause is included in the subject set of the marked clause then SS must be marked;

(iv) [+PERSON, +NUMBER]: both person and number control the SS/DS marking such that the conditions under (ii) and (iii) both apply.

It was noted that no language in the sample of languages that had information on referential overlap marked DS in all cases of referential overlap. Although the sample was small, i.e. information was only available on about fifteen languages for this test, it would seem to be unlikely that a language would not allow any referential overlap at all.

5. THE SEMANTIC FUNCTIONS OF SS/DS IN PNG LANGUAGES

In this and the following section we will discuss the semantic and syntactic functions of SS/DS marking in PNG languages. The semantic function relates to the question of which nominal – subject, agent or topic for example – the SS/DS system tracks.

When Jacobsen (1967:240) coined the term "switch-reference" he characterised the phenomenon as a morphological marking indicating a switch in subject or agent. In Jacobsen (1983), he makes clear that the term he coined was meant to define the morphological marking that indicated a *change* in subject or agent. Haiman and Munro (1983:ix), on the other hand, use the term "switch-reference" to define the morphology that indicates whether the subject changes or remains the same. So in Haiman and Munro's terms switch-reference = SS/DS. This is also the sense in which I have discussed SR in PNG languages. Haiman and Munro go further, however, and define SR as a device that primarily tracks the reference of the syntactic subject:

> Characterisation of the notion 'subject' is strictly syntactic, rather than semantic or pragmatic in most cases: it is not the agent or topic whose identity is being traced (Haiman and Munro 1983:xi).

In this section I will examine this claim in some depth and seek to demonstrate that SS/DS systems in PNG languages can, in fact, be diagnosed as either agent-oriented or topic-oriented.

Bruce (1984) identifies the agent or Actor-NP as the NP that triggers SS/DS in Alamblak. For the majority of clauses in Alamblak, a subject-NP can be identified by several semantic and syntactic features, i.e. subject-NPs are:

(i) unmarked for case;

(ii) cross-referenced by the first verbal pronominal suffix;

(iii) the left-most of the nuclear NPs in the clause;

(iv) the agent or causer of the clause, if there is one;

(v) and the NP that is most accessible to relativisation.

In most cases a single NP in the clause will have all of these properties and can be unambiguously defined as the subject-NP. However, in some cases two NPs in the clause can share some of these properties, e.g. inalienable possessed and possessor NPs. In (69a) the possessed NP has the subject property of being the left-most NP but it is cross-referenced on the verb as U(ndergoer). The possessed NP is cross-referenced on the verb as A(ctor) but it cannot occur as the left-most NP, as in (69b).

[POSSESSOR NP] [POSSESSED NP]

(69)a. *Yima-r* *nūngram-t* *kina-më-t-r.*
person-3SGM throat-3SGF dry-REMP-3SGF.A-3SGM.U
The man is dry (in his) throat, i.e. is thirsty. (Alamblak)

b. **Nūngram-t* *yima-r* *kina-më-t-r.*
throat-3SGF person-3SGM dry-REMP-3SGF.A-3SGM.U

The left-most possessor NP also has another subject property in that it can be relativised on, as in (70a), whereas the possessed NP cannot be relativised on, as in (70b). The meaning of the undefined abbrevation is DEM(onstrative).

[REL. CLAUSE]

(70)a. *ind* *tir-t* *famë* *yima-r* *hiti-an-r.*
DEM hand.3SGF ache.REMP person-3SGM see-1SG.A-3SGM.U
I saw the man (whose) hand ached.

[REL. CLAUSE]

b. **ind* *yima-r* *famë* *tir-t* *hiti-an-t.*
DEM person-3SGM ache.REMP hand.3SGF see-1SG.A-3SGF.U
I saw the hand of the man (which) ached. (Alamblak)

However, where subject properties are divided between a referentially prominent topic-NP and a less referentially prominent agent-NP it is the less referentially prominent agent-NP which is tracked by the SS/DS system in Alamblak. In (71) the first clause has a single NP argument, *na* 'I', which functions as the Actor-NP of the clause. The second clause has a possessed NP, *mëfhat* 'head', which is cross-referenced on the verb as Actor, and the 'I' is cross-referenced on the verb as Undergoer. The second clause controls the SS/DS marking and, since there is a change in the Actor-NPs across the clauses, the first clause is marked for DS. In this case the clause having the NPs dividing the topic and agent properties is the controlling clause and it is the agent-NP that is monitored by the SS/DS system rather than the more referentially prominent topic-NP.

(71) *Na* *hingna-më-t-a* *mëfha-t* *fa-më-t-a.*
1SG work-REMP-DS-1SG.A head-3SGF eat-REMP-3SGF.A-1SGM.U
I worked hard and my head hurt me. (Alamblak)

A similar situation holds when the clause having the NPs dividing the topic and agent properties is the marked clause. In (72) the first clause has the NPs with the divided topic and agent properties and in this case *nūngramt* 'throat' is the Actor-NP and *yimar* 'person' is the Undergoer-NP. Since the Actor-NP of the following controlling clause is *yimar* 'person' the first clause is again marked DS. So, in Alamblak, whether the clause having the

NPs dividing the topic and agent properties functions as the controlling clause or the marked clause it is the agent-NP that triggers DS marking in each instance.

(72) *Yima-r* *nũngram-t* *kina-më-t-t-r* *bupa-m*
person-3SGM throat-3SGF dry-REMP-DS-3SGF.A-3SGM.U water-3PLL
fut-më-r.
drink-REMP-3SGM.A
A man was dry because of (his) throat (and) he drank water. (Alamblak)

Another approach to defining which nominal SS/DS systems in general and SS/DS systems in PNG languages in particular track has been taken by Foley and Van Valin. Following Dixon's (Dixon 1972) usage of the term 'pivot' to describe the absolutive case in Dyirbal, Foley and Van Valin (1984) suggested the terms Pragmatic Pivot (PrP) and Semantic Pivot (SmP) for redefining the notion 'Subject' cross-linguistically. Their suggestion is that languages have a pivotal syntactic category around which the syntax of the language operates. However, this pivotal category operates on either pragmatic or semantic factors depending on the language.

In English, for example, the subject-NP can be identified as a PrP. This is because the subject-NP has primary access to a number of syntactic processes in English, such as: subject-auxiliary inversion in questions, participial relativisation – only the subject-NP can be relativised on, subject raising – only a subject-NP can be raised to subject position, object-raising – only a subject-NP can be raised to the object position, and in NP ellipsis under identity in coordinate structures the elided NP can only be construed as subject. In addition, English also has the syntactic device of passivisation for promoting object-NPs with a semantic P-role to the favoured single nominative position. Schematically this operates as in Figure 10.

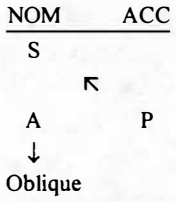


FIGURE 10: PASSIVISATION

An example from English of how passive interacts with ellipsis under identity is given in (73). In (73a), the active form, it can only be construed that Fred (Agent) ran away. Whereas in (73b), the passive form, it can only be construed that Bill (Patient) ran away.

(73)a. *Fred hit Bill and ___ ran away.*

b. *Bill was hit by Fred and ___ ran away.*

Therefore English is a language that uses passivisation to switch the semantic roles of NPs against the syntactic functions, which remain constant. Foley and Van Valin argue that the factors by which speakers choose to select either the A-role NP or the P-role NP for the subject position are purely pragmatic and determined by discourse and topicality considerations.

Another language that Foley and Van Valin cite as having a PrP is Dyirbal. Dyirbal has syntactic ergativity such that the absolutive case has the same pivotal function in the syntax as the nominative case has in English. Dyirbal also has a process of antipassivisation whereby the A-role NP can be promoted to the favoured absolutive position. This is illustrated in Figure 11.

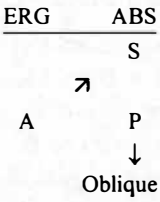


FIGURE 11: ANTIPASSIVISATION

The Dyirbal example (74a) is in the ergative–absolutive case so the elided NP in the second clause can only refer to *ɖugumbil* 'woman-ABS'. However, in (74b) the verb is in the antipassive form. *Yara* 'man' has been promoted to the absolutive case and *ɖugumbil* 'woman' has been demoted to the oblique dative case. So the elided NP in the second clause can only refer to *yara* 'man-ABS'. In a language like Dyirbal the absolutive case therefore has a similar function to that of the nominative case in English and also constitutes the PrP in that language.

(74)a. *Balan ɖugumbil baŋgul yaɽaŋgu balgan* ___ *baɲinu.*
woman-ABS man-ERG hit came-here
The man hit the woman and (the woman) came here.

b. *Bayi yara bagun ɖugumbil-gu balgal-ŋa-nu* ___ *baniɲu.*
man-ABS woman-DAT hit-ANTI came-here
The man hit the woman and (the man) came here. (Dyirbal)

However, Foley and Van Valin also say that some languages do not have a pivotal NP position in the syntax that is pragmatically determined. Such languages do not have a passive or antipassive device for changing semantic roles against syntactic functions. In these languages the semantic role of Agent is taken as pivotal and constitutes a SmP. Foley and Van Valin cite Kewa as a typical example of a language with a SmP. In Kewa the single argument (S) of the intransitive clause is conflated with the agent argument (A) of the transitive clause as the SmP and this is the NP that is monitored for SS/DS by the SR system. This is illustrated by (75)-(77).

(75) *Ní réka-a ágaa lá-lo.*
1SG stand-SS talk say-1SG.PRES
I stood up and am speaking. (Kewa)

(76) *Rúdu yo-a madá na-ria-a.*
short be-SS enough NEG-carry-3SG.PAST
It was short and didn't reach. (Kewa)

(77) *Ní réka-no ágaa lá-lo.*
1SG stand-3SG.DS talk say-1SG.PRES
I stood up and he spoke. (Kewa)

However, Foley and Van Valin also cite Barai, a Papuan language that has a PrP, even though there is no active–passive alternation in Barai. PrP in Barai is defined by Olson as:

> the most salient NP of the clause in terms of the intersection of features of both discourse (i.e. definiteness and specificness) and inherent topicality (i.e. animacy and grammatical position in the clause) (Olson 1981:363).

In Barai there is a major division of verbs between those that refer to a controlled predicate versus those that refer to an uncontrolled predicate. For predicates with two arguments the controlled predicate selects the left-most position as the most referentially prominent and the uncontrolled predicate selects the position immediately preceding the verb as the most prominent. For controlled predicates A-role occupies the PrP position and for uncontrolled predicates P-role occupies the PrP position. Other entities can occupy the PrP position in each case, however, and access to these positions is determined by two hierarchies:

animate > inanimate

definite > indefinite/specific > unmarked > indefinite/non-specific

So for the left-most position of the controlled predicate, the nominal highest on the definite/specific hierarchy will occupy this position and, all things being equal, an animate nominal will have precedence over an inanimate nominal for this PrP position. With the preverbal position of the uncontrolled predicate, on the other hand, an animate nominal will always have precedence over an inanimate nominal for the PrP position. Barai also has a SS/DS system and with respect to the foregoing it is the PrP position that is tracked as same or different. Examples (78)-(79) are taken from Olson (1981). In both (78) and (79) the two argument predicate *sak* 'bite' is controlled. In (78) the unmarked PrP is *fu* 'he', since it is animate, and *miane* 'firestick' is not so it is *fu* that is coreferenced as same PrP. In (79) the marked PrP is *miane*, since it is definite, and this is coreferenced as a different PrP to *fu*.

(78) *Fu miane sak-i-na barone.*
3SG firestick bite-3SG.O-SS die
A firestick bit him and he died. (Barai)

(79) *Miane ije fu sak-i-mo fu barone.*
firestick DEF 3SG bite-3SG.O-DS 3SG die
The firestick bit him and he died. (Barai)

In (80) and (81) both the predicates *tot* 'escape memory' and *visinam* 'sicken' are uncontrolled. In (80) the PrP is *na* 'I' and this is coreferenced as different from *fu* 'it'. In (81) the PrP is again *na* but here it is coreferenced as being the same across the clauses.

(80) *Kusare ije na tot-ie-mo fu saere.*
flower DEF 1SG escape memory-1SG.O-DS 3SG wither
The flower escaped my memory and it withered. (Barai)

(81) *Na visinam-ie-mo do ije ised-ie.*
1SG sicken-1SG.O-SS water DEF displease-1SG.O
(Something) sickens me and the water displeases me. (Barai)

The Barai SS/DS system is therefore controlled by pragmatic factors of discourse topicality such as position in the clause, definiteness, specificity and animacy. The SS/DS system checks for coreferentiality between the most topical NPs across clauses. In the case of controlled predicates with both an A and P argument the most topical NP can be either depending on the pragmatic factors assigned to each NP. In the case of uncontrolled predicates, on the other hand, the P argument is always more topical than the A argument, if there is one. Therefore, whereas the Alamblak SS/DS system tracks the agent-role argument, the Barai SS/DS system tracks the topic-role argument. Alamblak has an agent-oriented SS/DS system and Barai has a topic-oriented SS/DS system.

Another Papuan language that has a topic-oriented SS/DS system is Amele. In Amele, as in Alamblak, the subject-NP can be unambiguously identified by several semantic and syntactic features for the majority of clauses. These properties are that the subject-NP is:

(i) unmarked for case;

(ii) cross-referenced by the last verbal pronominal suffix;

(iii) the left-most of the nuclear NPs in the clause;

(iv) not part of the VP;

(v) the agent;

(vi) and the NP that is most accessible to relativisation.

However, also as in Alamblak, there are cases where these subject properties can be divided between two NPs in the clause. Like many Papuan languages, Amele has impersonal verb constructions,[8] so-called because they lack subject-person contrast and always occur with only third person singular subject agreement. There are several types. In one type a nominal constituent occurs followed by verb inflection which must include DO agreement. A typical example is that of (82).

(82) *Ija wen-te-i-a.*
1SG hunger-1SG.DO-3SG-TODP
I was hungry. (Amele)

The impersonal verb describes a physiological or psychological state and a free pronoun or other nominal can occur before the impersonal verb which refers to the entity experiencing the particular state described by the verb. Although the experiencer-NP *ija* 'I' in (82) functions as the subject of the clause on a positional basis it is not cross-referenced as subject on the impersonal verb. Instead, there is concord between it and the DO inflection on the verb. There is, in fact, evidence that the subject-NP of an impersonal verb constructions such as (82) is *wen* 'hunger'. This functions like a verb stem but is actually the subject-NP incorporated into this position.

Firstly, it can be demonstrated that this constituent is actually a NP by the fact that it can be readily expanded as such, as in (83). It is also the case that for some impersonal verb forms this constituent is an NP to begin with, as in (84) for example.

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8 Impersonal verb constructions in Amele are equivalent to uncontrolled predicates in Barai.

(83) *Ija wen ben bahic te-i-a.*
1SG hunger big very 1SG.DO-3SG-TODP
I was very hungry. (Amele)

(84) *Ija wa gab te-i-a.*
1SG water cup 1SG.DO-3SG-TODP
I was thirsty. (Amele)

Secondly, it can be shown that this nominal constituent refers to the causer of the experience and therefore is the subject-NP of the impersonal verb. Some of the nominals that form the stems of impersonal verbs are inalienably possessed nouns, which have their own possessive agreement morphology. An inalienably possessed noun will agree in person and number with the possessor. Some examples are given in (85a)-(85g).

(85)a. *Bebesa-ni (*bebesa-n) te-na.*
disapproval-1SG.POS disapproval-3SG.POS 1SG.DO-3SG.PRES
I am disapproved of.

b. *Maja-ni (*maja-g) te-na.*
shame-1SG.POS shame-3SG.POS 1SG.DO-3SG.PRES
I am ashamed.

c. *Gogodo-mi (*gogodo-h) te-na.*
backbone-1SG.POS backbone-3SG.POS 1SG.DO-3SG.PRES
My back hurts me.

d. *Sesewa-ni (*sesewa-n) te-na.*
trembling-1SG.POS trembling-3SG.POS 1SG.DO-3SG.PRES
I am trembling.

e. *Ilo-mi (*ilo-∅) q-iti-na.*
head-1SG.POS head-3SG.POS hit-1SG.DO-3SG.PRES
My head hurts me.

f. *Malasa-ni (*malasa-c) q-iti-na.*
pancreas-1SG.POS pancreas-3SG.POS hit-1SG.DO-3SG.PRES
I have goosepimples.

g. *Waw-i (*wau-g) q-iti-na.*
stomach-1SG.POS stomach-3SG.POS hit-1SG.DO-3SG.PRES
I am sad. (Amele)

The first four examples, (85a)-(85d), just have a possessed noun followed by impersonal verb morphology. The last three examples, (85e)-(85g), have a possessed noun followed by the verb *qoc* 'to hit' inflected for impersonal verb morphology. In each case, however, the possessed noun must agree with the experiencer-NP, who is also the possessor. It is ungrammatical for the possessed noun to be inflected differently from the possessor for person and number. Some of the impersonal forms have body part possessed nouns, such as *gogodoh* 'backbone' and *ilo* 'head'. In these cases it is clear from the meaning that these body parts are the cause of the experience.

So this evidence demonstrates that the incorporated nominal in the impersonal verb construction is understood to be the causer of the experience and it is this nominal that is cross-referenced as the subject of the verb. However, this nominal no longer occupies the

subject position in the clause. Amele has SOV basic word order and therefore the subject-NP normally precedes the object-NP. It is actually ungrammatical for the causer-NP to precede the experiencer-NP, as in (86) for example.

(86) **Wen ija te-i-a.*
hunger 1SG 1SG.DO-3SG-TODP (Amele)

The experiencer-NP also has the subject property of not being part of the VP constituent. Normally the negator *qee* 'not' can occur preceding the verb and preceding any element governed by the verb in the VP but it cannot occur before the subject-NP since *qee* is a constituent of the VP. This is illustrated by (87). In the case of the impersonal verb, however, the negator cannot precede the experiencer-NP, as in (88) for example. The meaning of the undefined abbreviation in these examples is NEG(ative)P(ast tense).

(87) *(*Qee) ija (qee) dana eu (qee) sab (qee) siw-i-ade-l-em.*
not 1SG not man that not food not share-PRED-3PL.DO-NEGP-1SG
I did not share out the food to those men. (Amele)

(88) *(*Qee) ija (qee) wen-te-l.*
not 1SG not hunger-1SG.DO-NEGP.3SG
I was not hungry. (Amele)

The experiencer-NP is therefore functioning as subject on a positional basis even though it is marked on the verb as direct object. The experiencer-NP can also be readily relativised on, as in (89), but it is not possible to relativise on the causer-NP.

[REL.CLAUSE]
(89) *Dana aluh=dec n-eig-a eu age wen ade-na.*
man mountain=from come down-3PL-TODP that 3PL hunger 3PL.DO-3SG.PRES
The men that came down from the mountains are hungry. (Amele)

Therefore, in the Amele impersonal clause it is the experiencer-NP that has the referential or topic-like properties while the causer-NP has the semantic properties of agent or causer. With regard to the SS/DS system, however, it is the experiencer-NP which is coreferenced as SS in the unmarked case. A typical example would be (90a). The subject of the serial verb *cocobi lilig* is first person 'I' and this is coreferenced as SS with the experiencer-NP in the following impersonal clause. Note that (90a) is the unmarked case. The verb preceding an impersonal verb can be marked with DS, as in (90b) for example, but this has the meaning of some causal agency other than the causer-NP of the impersonal verb.

(90)a. *Ija co-cob-i li-li-g wen-te-i-a.*
1SG DUR-walk-PRED DUR-go-1SG.SS.SIM hunger-1SG.DO-3SG-TODP
As I walked along I became hungry.

b. *Ija co-cob-i li-li-gin wen-te-i-a.*
1SG DUR-walk-PRED DUR-go-1SG.DS.SIM hunger-1SG.DO-3SG-TODP
As I walked along something made me hungry. (Amele)

As mentioned in Roberts (1988b), when several impersonal clauses are linked by the SS/DS system in Amele they are normally coded as SS, as illustrated by (91). This is similar to the way Barai codes uncontrolled predicates as SS when they are linked by the SS/DS system in that language (see (81) for example). Thus when the syntactic arrangement is that an impersonal clause follows and controls another impersonal clause the SS/DS system

compares the two experiencer-NPs and, if they are coreferential, marks them as 'same subject'.

(91) *Ija dadan-t-i-me-i cucui-te-i-a.*
1SG confuse-1SG.DO-PRED-SS-3SG fear-1SG.DO-3SG-TODP
I was confused and then afraid. (Amele)

So the SS/DS system in Amele picks out the referentially prominent experiencer or topic-NP as the one to track rather than the causer/agent-NP. The subject properties of NPs in impersonal verb constructions in Amele are summarised in Table 18.

TABLE 18: SUBJECT PROPERTIES OF IMPERSONAL CLAUSE NPS IN AMELE

	Causer-NP	Experiencer-NP
SuAgr	yes	no
Left-most NP	no	yes
VP constituent	yes	no
Agent/Causer	yes	no
Relativisable	no	yes
SR coreferences	no	yes

Impersonal verb constructions are reported to occur in a number of Papuan languages. In the examples given below from Telefol, Usan, Amele and Yau the SS/DS pattern is the same as in the Amele case discussed above, the topic-NP is selected as the one to be tracked by the SS/DS system. The meanings of the undefined abbreviations in (92) are DEL-(ayed).SEQ(uence) and P(er)F(ecti)V(e aspect).

(92) *Daám boóyó fákán-bi-nal-a-ta daál*
fence that make-DEL.SEQ-SS-3SG.M-then tiredness
tebe-b?-ee-b-u.
happen-PFV-3SG.BEN-PAST-3SG.F
He got tired of fencing. (Telefol)

(93) *Munon isig eng sarau âib eb-et migeri wâr-a wegibâ.*
man old this work big do-SS exhaustion 3SG.DO.hit-DS stop.3SG.FUT
The old man is working hard, he will be exhausted and will stop working.(Usan)

(94) *Filicit-i caj-i-me-i dain do-co-b mad-en ...*
startle-PRED arise-PRED-SS-3SG pain 3SG-DS-3SG say-3SG-REMP
Startled and in great pain he got up and said ... (Amele)

In the impersonal verb construction in Yau (95) the verb 'to give' functions as the predicate and the experiencer-NP is coded on the verb as IO. The subject agreement can be either 3SG or 3PL depending on the verb. Lauver and Wegmann (1990) say that the experiencer-NP 'subjects' of impersonal verbs do not force a DS marking on the preceding medial verb.

(95) *Noc komic dec ep-ng-ka sum na-mo-ang.*
1SG rain in come-SS-? cold 1SG.IO-give-3PL.PRES
I came in the rain and (so) I feel cold. (Yau)

Notice that in the Amele and Usan examples, the subject of the impersonal clause itself is coded as DS with respect to the subject of the following agent/topic-subject (A/T-S) clause, which is coreferential with the experiencier-NP of the impersonal clause in each case. So where a split-subject (split-S) impersonal clause occurs between two A/T-S clauses in the clause chain there is a sequence of asymmetric SS and DS marking, as illustrated in Figure 12.

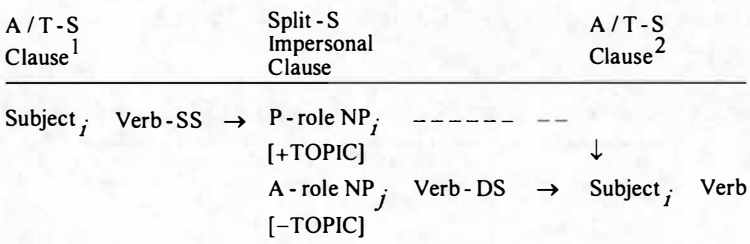

FIGURE 12: ASYMMETRIC SS-DS MARKING WITH SPLIT-S IMPERSONAL CLAUSES

The SS/DS marking on the verb in A/T-S clause[1] coreferences the more referentially prominent P-role NP in the split-S impersonal clause as SS. However, when the SS/DS system checks coreferentiality of subjects across the split-S impersonal clause and A/T-S clause[2] it checks the A-role NP in the impersonal clause against the subject-NP in A/T-S clause[2] and therefore marks DS. In effect, what is happening is that the P-role NP in the split-S impersonal clause is 'promoted' to the subject position for comparing with a preceding subject of a A/T-S clause and the A-role NP is 'demoted' to a subordinate position. This simulates passivisation in a language like English, cf. Figure 10, where the P-role NP is promoted to the subject position and the A-role NP is demoted to an oblique position. When the SS/DS system compares the 'subject' of a split-S impersonal clause with a following A/T-S clause the A-role NP is chosen as the default subject of the impersonal clause.

Haiman (1980:357-364) describes Hua as having both split-S impersonal verbs and a SS/DS system. In Hua, however, the split-S impersonal verbs interact with the SS/DS system in a slightly different way to that in languages such as Amele, Telefol, Usan and Yau. In Hua, when an A/T-S clause precedes a split-S impersonal clause the A/T-S clause must be marked as DS and it is ungrammatical for it to be marked SS. This is illustrated by (96). On the other hand, when a split-S impersonal clause precedes a A/T-S clause the impersonal clause must be marked as SS, if the experiencer-NP is coreferential with the subject of the following A/T-S clause. It is ungrammatical for it to be marked DS. This is illustrated by (97).

(96) *Korihu-ga-na* *(*korihu-da)* *dauiahie.*
run away-DS-3SG.ANTICSU run away-1SG.ANTICSU I am ashamed
I ran away and I am ashamed. (Hua)

(97) *Hadaudi hu-da* *(*hu-ga-da)* *koe.*
sorrow do-1SG.ANTICSU do-DS-1SG.ANTICSU I see him
I feel sorry and I see him. (Hua)

In Hua the subject of a A/T-S clause is checked against the A-role argument of a following impersonal clause and marked DS but when the impersonal clause itself is checked against a following A/T-S clause for subject coreferentiality the SS/DS system refers to the P-role argument in the impersonal clause and compares this with the subject of the following A/T-S clause. This is illustrated by Figure 13.

A / T - S Clause[1]			Split - S Impersonal Clause			A / T - S Clause[2]	
Subject$_i$	Verb - DS	→	A - role NP$_j$ [–TOPIC]	– – – – – –	– –	↓	
			P - role NP$_i$ [+TOPIC]	Verb - SS	→	Subject$_i$	Verb

FIGURE 13: ASYMMETRIC SS-DS MARKING WITH SPLIT-S IMPERSONAL CLAUSES IN HUA

Haiman (1980) basically has no explanation for this anomalous SR marking. However, it can be accounted for if we understand that, whereas the asymmetric SS-DS marking in Amele simulates passivisation, the same marking in Hua simulates antipassivisation, cf. Figure 11. In Hua the A-role NP in the impersonal clause is promoted to the subject position for comparing with the subject of the preceding A/T-S clause and the P-role NP is demoted to a subordinate position. The P-role NP in turn is the default subject of the impersonal clause for comparing against the subject of a following A/T-S clause.

This analysis is borne out by the fact that Hua, according to Haiman, does have morphological ergativity marked by *-mu* on the subjects of transitive verbs. Haiman maintains that ergativity is purely morphological and not syntactic in Hua, since subjects of both transitive and intransitive verbs are marked by one type of verb agreement and objects, whether direct or indirect, are marked by a different type of verb agreement. However, the syntax of the SS/DS system in Hua clearly operates on an ergative basis with respect to the split-S impersonal verbs. In Amele, by contrast, the SS/DS system operates on an accusative basis with respect to split-S impersonal verbs. This contrast is illustrated by Figure 14.

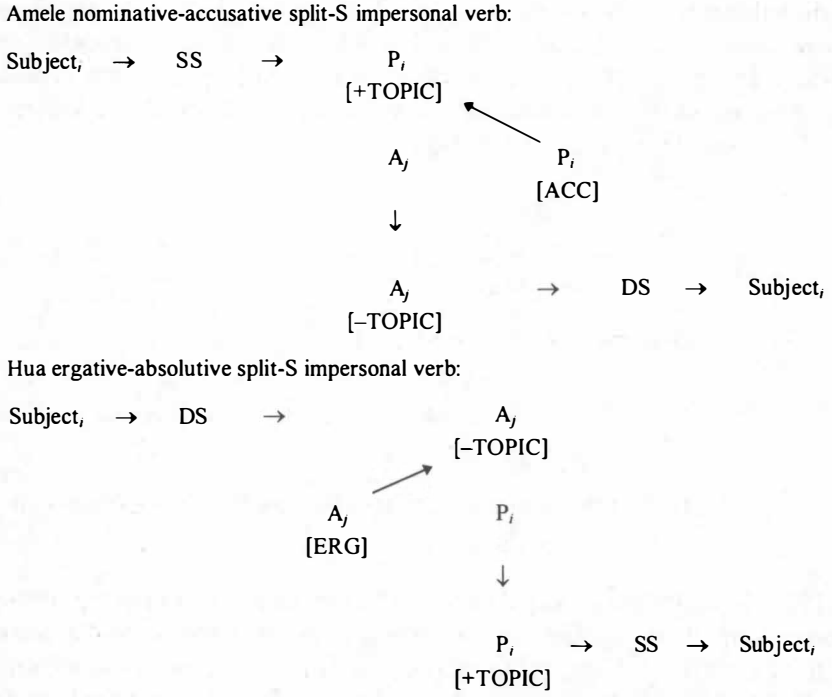

FIGURE 14: COMPARISON OF ASYMMETRIC SS-DS MARKING AND ACCUSATIVE VERSUS ERGATIVE SPLIT-S IMPERSONAL VERB TYPES

When the impersonal clause is the controlling clause the SS/DS system compares the promoted argument in the impersonal clause with the subject of the preceding A/T-S clause. In Amele this is the accusative P-role argument, which is specified as [+TOPIC, –AGENT]. The subject of the preceding A/T-S clause is also [+TOPIC] so SS is marked. In Hua, however, the promoted argument in the impersonal clause is the ergative A-role argument and this is specified as [–TOPIC, +AGENT]. When this is compared with the subject of the preceding A/T-S clause DS is marked because of the difference in topicality status.

When it is the turn of the A/T-S clause to be the following controlling clause the subject of this clause is compared with the demoted argument in the impersonal clause. In Amele this is the nominative A-role argument specified as [–TOPIC, +AGENT] so DS is marked, since there is a change of topicality status. In Hua the demoted argument is the absolutive P-role argument specified as [+TOPIC, –AGENT] and, since there is no change in topicality status, SS is marked. Thus the different systems of asymmetrical SS/DS marking between Amele accusative impersonal clauses and Hua ergative impersonal clauses demonstrates that the SS/DS systems in these languages are comparing the topicality status of syntactic pivots across clauses.

It is also the case that the impersonal verb constructions in these languages are operating respectively like passive and antipassive grammatical function changing devices. This explains why the SS/DS system looks at the promoted argument when the impersonal clause is the controlling clause and the A/T-S clause is the marked clause, yet looks at the demoted

argument when the A/T-S clause is the controlling clause and the impersonal clause is the marked clause.

Another Papuan language that has morphological ergative case marking and a SS/DS system is Enga. Li and Lang (1979:319), after discussing the referential properties of the ergative case in Enga, conclude that "ergativity in Enga is merely a morphological phenomenon without any noticeable syntactic or semantic consequences." However, Enga does not appear to have ergative impersonal verb forms of the type found in Hua so it is not possible to test whether the Enga SS/DS system is sensitive to ergativity in the same way that the Hua SS/DS system is.

From the foregoing it can be seen that an SS/DS system tracks through a clause with a split-S in four different ways, depending on the type of SS/DS system and the type of split-S clause. This is illustrated in Table 19.

TABLE 19: THE FOUR BASIC TYPES OF SS/DS TRACKING SYSTEMS

	A/T-S Clause Preceding	Split-S Clause	A/T-S Clause Following
Alamblak agent-oriented	$S/A/T_i \rightarrow$ DS	A_j [–TOPIC] → DS P_i [+TOPIC]	$S/A/T_i$
Barai topic-oriented	$S/A/T_i \rightarrow$ SS	P_i [+TOPIC] → SS A_j [–TOPIC]	$S/A/T_i$
Amele topic-oriented with P[ACC] promotion	$S/A/T_i \rightarrow$ SS	P_i [+ TOPIC, + ACC] A_j [–TOPIC] → DS	 $S/A/T_i$
Hua topic-oriented with A[ERG] promotion	$S/A/T_i \rightarrow$ DS	A_j [– TOPIC, + ERG] P_i [+TOPIC] → SS	 $S/A/T_i$

First there is the Alamblak SS/DS system which only tracks the A-role NP. This is an agent-oriented system. It marks DS going into a split-S clause and DS coming out. Next is the Barai SS/DS system which only tracks the PrP or topic. This is a topic-oriented system. It marks SS going into a split-S clause (i.e. a controlled predicate) and SS coming out. Then there are the Amele and Hua SS/DS systems. These SS/DS systems are both topic-oriented and function basically in the same way. When going into a split-S clause they compare the A/T-S of the preceding clause with the promoted NP in the split-S clause. In Amele this is P[+TOPIC, +ACC] and SS is marked. In Hua this is A[-TOPIC, +ERG] and DS is marked. When coming out of a split-S clause they compare the demoted NP in the split-S clause with the A/T-S of the following clause. In Amele the demoted NP is A[–TOPIC, +NOM] and DS is marked. In Hua it is P[+TOPIC, +ABS] and SS is marked. The difference between the Amele and Hua SS/DS systems is that, whereas in Amele the impersonal split-S clauses are nominative-accusative, in Hua they are ergative-absolutive.

Another type of subject nominal that produces asymmetric SS–DS marking in Amele is inalienably possessed body parts. In this case the body part NP functions as the single argument of the clause. However, the asymmetric SS–DS marking indicates that it has

demoted or subordinated topicality status with regard to the subject of the preceding clause. Some examples are given in (98)-(99). Examples of asymmetric SS–DS marking produced by body part nominals are also given from Nobonob (100) and Nend (101). The interesting point about Nend, however, is that the split between the topical and non-topical NP is actually marked on the verb as such in this language by the DS+SS marking.

(98) *Cali hu-me-b ege co-nige cule-ce-b taw-om.*
come.out(SS) come-**SS**-1PL 1PL mouth-1PL.POS leave-**DS**-3SG stand-1PL.REMP
We came out and stood with our mouths open. (Amele)

(99) *Odi mad-i-me-i dahi-g cele-ce-b us nij-en.*
like say-PRED-**SS**-3SG ear-3SG.POS forget-**DS**-3SG sleep lie-3SG.REMP
He said like that and then he forgot (lit. his ear forgot) about it and went to sleep. (Amele)

(100) *Da amahlak okainab an-t-ena da ame-l*
1SG light very.big see-3SG.DO-1SG.**SS** 1SG eye-1SG.POS
gu-id-om.
hurt-1SG.DO-3SG.PAST
I saw a strong light and my eye hurt me. (Nobonob)

(101) *Nd-e-mi-ŋ nti hamb okalaw-emi-l.*
walk-**SS**-IR-1SG.DS blood this clot-YESTP-3SG
I walked and the blood clotted. (Nend)

This pattern of asymmetric SS–DS marking can also occur with other inanimate subjects. Longacre (1972) noted that occasionally anomalous SS marking occurred in some Papuan languages which he suggested 'overlooked' inanimate subjects. Examples (102)-(104) are given from his book. (102) is taken from Buin where *eetogimo* 'we do-SS' coreferences the subject of the following clause, *raiti* 'rice', as SS when, in fact, it is a different grammatical subject. The verb *kinatuguraagu* 'it grows-DS' brings the reference back to the human/animate subject.

(102) *Egu iko raiti kuruin eetogi-mo egu kinatuguraa-gu aapotogiguo.*
now that rice sow 1PL.do-**SS** now 3SG.grow-**DS** 1PL.plant.3SG
Now we sow that rice and when it comes up we plant it. (Buin)

In the Gahuku example, (103), the subject of *zeuke* is first person. Gahuku indicates SS, if the tense/mood of the final verb is non-future, with an invariant suffix *-ke*. DS is indicated in this case by a set of subject agreement markers particular to this form of the verb. Again the SS marking indicates that the subject, *golini* 'rain', is inanimate and therefore lower in topicality status than the subject 'I'. The DS marking returns the reference to the more topical human/animate subject.

(103) *Nagamiq zeu-ke golini zeka-go numukuq minuve.*
water hit-**SS** rain hit-3SG.**DS** house-in stay.1SG.PAST
I washed (it) and because it rained I stayed in the house. (Gahuku)

In the Kobon example, (104), taken from Davies (1981), the subject of the 'dawning' clause is subordinated by the SS marking on the previous clause to a lower level of topicality. Davies comments that the subjects of such clauses can equally well be coded as

DS, if the speaker thinks their topicality status is the same as the subject of the preceding clause.

(104) *Yad ram mid-em ram ru-öp ar-bin.*
1SG house be-1SG.**SS** earth dawn-3SG.**DS** go-1SG.PFCT
I waited and went at daybreak. (Kobon)

Another example is given from Fasu, (105), taken from Loeweke and May (1980), where the subject of *tikia* 'dam-SS' is 'we' and the subject of *porarakano* is 'river' yet *tikia* is marked for SS.

(105) *He ti-kia pora-rakano ko-koa pokoa mo-koa ...*
water dam-**SS** dry-CONSECUTIVE.**DS** search-SS fish take-SS
(We) dam up the river and it dries and (we) search and pick up fish ... (Fasu)

In the Buin, Gahuku, Kobon and Fasu examples above the same principle operates with respect to the SS/DS marking that operates with the impersonal clause and body part subject examples, namely, that a clause is marked for SS following when in fact it is a different grammatical subject, thus indicating a referential split between a human/animate subject and an inanimate subject. The inanimate subject is treated as topically subordinate to the human/animate subject by the SS/DS system. In these cases the SS–DS pattern observed could be explained in terms of the higher animacy status of the first subject nominal over the second subject nominal. However, it is also the case that subject nominals that refer to humans can be treated as topically subordinate by SS/DS systems.

In the Amele example, (106), the subject of *limeu* 'go-SS' does not include *Mrs Fensky* so should not be marked as SS on the basis of referential overlap. In fact, the SS marking on this verb indicates that *Mrs Fensky*, as subject of the following verb, is topically subordinate even though it has a human referent.

(106) *Beli-me-u Mrs Fensky cemenug=na li-me-u ija hag=nu*
go-SS-1DU Mrs.Fensky near=to go-**SS**-1DU 1SG sickness=about
sisil-te-ce-b hag=nu made-ce-min ...
ask-1SG.DO-**DS**-3SG sickness=about say-DS-1SG
We (two) went to Mrs Fensky and when she asked me about my sickness I told her about my sickness ... (Amele)

An example of the same phenomenon is given in (107) from Kunimaipa, taken from Geary (1977), in which the verb *vetegipuho* 'we throw-SS' indicates that the next subject is topically subordinate.

(107) *Volop ure-gi-puho rangiza-ta rite-gi-puho zata va maino*
pig hit-1PL-SS burn-and divide-1PL-SS intestines get alone
vate-gi-puho helegade vete-gi-puho ginevikapi va-ta
make-1PL-SS hot stones throw-1PL-**SS** green.vegetable get-and
ema-ha-na veire-gi.
come-3PL-**DS** bury-1PL
We killed the pigs and burnt their hair and then butchered them and got the intestines, put them in a separate place, and when they brought green vegetables, we cooked it all in the ground oven. (Kunimaipa)

In the Timbe example, (108), taken from Foster (1981), the mechanism is even more striking. The verb *yekmâ* 'we (two) see-SS' indicates that the next clause is the beginning of a subtopicalised sequence. The sequence ends with *dâetne* 'we (two) said-DS' even though the subject of the next verb *âgâm* is the same, i.e. 'we (two)'. In this case the asymmetric SS–DS mechanism is operating over a number of clauses.

(108) *Yek-mâ yâkne ai netguyei yet wânân dâ-mbi?*
see-SS(1DU) 3PL Q 1DU.O-3PL.REMP 2DU where say-3PL.DS
Net egon dâ-etne âgâm âgâm ...
1DU up say-1DU.DS climb(SS) climb(SS)
We (two) saw them and they asked us, "Where are you from?" We (two) said, "We (two) are from up above," and we (two) continued climbing ... (Timbe)

In the Kobon example (109) the subject of *Udöm* 'she took-SS' is different from the subject of *arö* 'he went-DS' but the SS–DS mechanism indicates that *nimam* 'her brother' is topically subordinate in this context. Kewa also uses the same SS–DS mechanism for topic subordination according to Franklin (1983).

(109) *G-öl g-öm nipe wadi acir ne ud-a.*
do-SIM do-3SG.SS 3SG string.bag black 3SG take-REMP
Ud-ö nimam ar-ö haynö gi ñ-öl arik-a.
take-3SG.SS brother.3SG go-3SG.DS after do give-SIM leave-REMP.3SG
So doing she took her black string bag. Having taken it she followed her brother. (Kobon)

So it is clear from these examples that the asymmetric SS–DS mechanism first discussed with respect to impersonal verb constructions readily applies in a number of languages to NPs other than P-role NPs. In fact, it applies to subject-NPs, both inanimate and animate/human, to indicate their topicality status. The function of asymmetric SS–DS marking can therefore be revised to Figure 15.

Single Topic Clause[1]		Split Topic Clause		Single Topic Clause[2]	
Subject$_i$	Verb-SS →	Subject$_i$ [+TOPIC]	------	↓	
		Subject$_j$ [−TOPIC]	Verb-DS →	Subject$_i$	Verb

FIGURE 15: ASYMMETRIC SS-DS MARKING INDICATING TOPICALITY STATUS

The evidence presented in this section clearly undermines Haiman and Munro's claim (1983:x-xi) that it is the syntactic subject which is tracked by SS/DS systems rather than the agent or topic. It would seem that in PNG languages at least, in the unmarked case SS/DS systems track coreferentiality of subjects across clauses only when the subject-NP is a conflation of agent and topic properties. Where these properties diverge and are located in two different NPs in the clause, as in the case of impersonal clauses for example, then an

SS/DS system in a given language can be diagnosed as either an agent-oriented or a topic-oriented SS/DS system.

Four different types of SS/DS tracking systems have been identified as illustrated in Table 19. From the limited amount of data available it would appear to be the case that most SS/DS systems in PNG languages are topic-oriented rather than agent-oriented. In the languages investigated only Alamblak could be diagnosed as having a purely agent controlled SS/DS system. Whereas the languages of Barai, Telefol, Usan, Yau, Amele and Hua, for example, all have topic-oriented SS/DS systems which compare the topicality status of NPs in and out of split-S clauses. It was also noted that in Barai and Amele, where the following controlling clause and the preceding marked clause were both split-S, then the preceding split-S clause is marked SS. This is because in each case the P-role arguments across the split-S clauses have the same topicality status.

Data from a number of languages were also presented in this section to show how this basic function of checking the topicality status of 'subjects' across clauses applies to all clause types and not just to impersonal clauses. It was found that the device of asymmetric SS–DS marking could be readily extended to indicate the topicality status of all types of subjects.

6. THE SYNTACTIC FUNCTION OF SS/DS IN PNG LANGUAGES

Syntactic function refers to whether SS/DS medial clauses are in a subordinate or coordinate relationship with their controlling clause, which normally follows. Notwithstanding the fact that the distinction between coordination and subordination has been demonstrated by a number of linguists to be a cline from one to the other rather than a disjunctive opposition of two poles[9] there would appear to be a range of syntactic criteria that can be used to distinguish coordinate medial clauses from subordinate medial clauses in most Papuan languages. These criteria are:

(i) A subordinate medial clause can be structurally embedded within another matrix clause and can be in a dependency relationship with the verb of the matrix clause. A coordinate medial clause cannot be so embedded.

(ii) A subordinate medial clause can be extraposed to the end of the matrix clause, whereas a coordinate medial clause is usually fixed sequentially and cannot be extraposed.

(iii) A coordinate medial clause will be within the scope of the final clause in the clause chain for the categories of tense, mood and polarity. A subordinate medial clause will not be within the scope of the final clause and can be marked independently for these categories.

These distinctions can be demonstrated from Amele. The first clause in (110a) is an adverbial clause expressing purpose. The verb *qoqagan* is marked for the final verb tense category of future tense. Amele has a fairly free word order with respect to adverbial elements so that it is possible for the orders AdvCl S V and S AdvCl V to occur as in (110a)

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9 For example, Huddleston (1984:378-418) and Quirk et al. (1985:927) discuss the gradience between coordination and subordination in English and Foley and Van Valin (1984) and Haiman and Thompson (1988) discuss the gradience between coordinate and subordinate structures in languages in general.

and (110b) respectively. The second order, S AdvCl V, (110b), with the purpose clause embedded within the main clause is, in fact, the order preferred by native speakers.

(110)a. *Ho qo-qag-an=nu dana age h-oig-a.*
pig hit-3PL-FUT=PURP man 3PL come-3PL-TODP
The men came to kill the pig.

b. *Dana age ho qoqagannu hoiga.* (Amele)

However, a clause coordinated with the conjunction *qa* 'but' cannot be embedded within another clause, as illustrated by (111a)-(111b) below.

(111)a. *Ho busale-i-a qa dana age qo-ig-a.*
pig run.out-3SG-TODP but man 3PL hit-3PL-TODP
The pig ran out but the men killed it.

b. **Dana age ho busaleia qa qo-ig-a.* (Amele)

A medial SS/DS verb cannot be embedded within another clause. The verb in the first clause in (112a) is a medial SS/DS verb marked for DS. However, it is not possible to move the first clause in (112a) between subject and verb in a similar way to (110b). Example (112b) is not acceptable.

(112)a. *Ho busale-ce-b dana age q-oiga.*
pig run.out-DS-3SG man 3PL hit-3PL-TODP
The pig ran out and the men killed it.

b. **Dana age ho busaleceb qoiga.* (Amele)

It is usually possible to extrapose a subordinate clause and shift it to the end of the sentence for purposes of focus. So the purpose clause in (113a) can be shifted to the end of the sentence as in (113b) and the protasis in (114a) can be shifted to the end of the conditional sentence as in (114b).

(113)a. *Dana age ho qo-qag-an=nu h-oig-a.*
man 3PL pig hit-3PL-FUT=PURP come-3PL-TODP
The men came to kill the pig.

b. *Dana age ___ hoiga, ho qoqagannu.* (Amele)

(114)a. *Ija ja hud-ig-en=fi uqa sab man-igi-an.*
1SG fire open-1SG-FUT=if 3SG food roast-3SG-FUT
If I light the fire she will cook the food.

b. *___ Uqa sab manigian ija ja hudigenfi.*
She will cook the food if I light the fire. (Amele)

However, a coordinate clause cannot be end-shifted. For example, the first clause in (115a) conjoined with *qa* 'but' cannot be end-shifted as in (115b) and the first clause in (116a) conjoined with *fo* 'or' cannot be end-shifted as in (116b).

(115)a. *Ija ja hud-ig-a qa uqa sab mane-i-a.*
1SG fire open-1SG-TODP but 3SG food roast-3SG-TODP
I lit the fire but she cooked the food.

b. **___ Uqa sab maneia ija ja hudiga qa.* (Amele)

(116)a. *Uqa ja hud-igi-an fo qee sab man-igi-an.*
3SG fire open-3SG-FUT or not food roast-3SG-FUT
She will light the fire or cook the food.

b. **___ Uqa sab manigian uqa ja hudigian fo qee.* (Amele)

It is also usually not possible to extrapose an SS/DS medial clause. For example, the first clause in (117a), which has a DS medial verb, cannot be end-shifted as in (117b).

(117)a. *Ho busale-ce-b dana age q-oiga.*
pig run.out-DS-3SG man 3PL hit-3PL-TODP
The pig ran out and the men killed it.

b. **___ Dana age qoiga ho busaleceb.* (Amele)

However, if an SS/DS medial clause is marked as subordinate then it can be extraposed. For example, in (118a) the DS medial clause is subordinated by the conjunction *nu* 'purpose' so it is possible for it to be extraposed as in (118b). In (119a) the DS medial clause is subordinated by the conjunction *fi* 'if' so it is also possible for this clause to be extraposed as in (119b).

(118)a. *Dana age ho qo-co-bil=nu h-oig-a.*
man 3PL pig hit-DS-3PL=PURP come-3PL-TODP
The men came to kill the pig.

b. *Dana age ___ hoiga, ho qocobilnu.* (Amele)

(119)a. *Ho busale-ce-b=fi dana age qo-qag-an.*
pig run.out-DS-3SG=if man 3PL hit-3PL-FUT
If the pig runs out the men will kill it.

b. *___ Dana age qoqagan, ho busalecebfi.*
The men will kill the pig if it runs out. (Amele)

It is also possible in Amele to coordinate subordinate clauses with a coordinating conjunction such as *ca* 'and', as in (120) for example.

(120) *Dana age ho qo-qag-an=nu=ca, gel haun*
man 3PL pig hit-3PL-FUT=PURP=and fence again
ceh-oqag-an=nu=ca h-oig-a.
plant-3PL-FUT=PURP=and come-3PL-TODP
The men came to kill the pig and to rebuild the fence. (Amele)

However, it is not possible to coordinate SS/DS medial clauses with *ca* 'and', as in (121) for example.

(121) *Dana age ho q-u-me-ig (*=ca) gel haun ceh-i-me-ig*
man 3PL pig hit-PRED-SS-3PL (and) fence again plant-PRED-SS-3PL
(=ca) jobon cesel-i bel-eig-a.*
(and) village return-PRED go-3PL-TODP
The men killed the pig, built the fence and went home. (Amele)

A SS/DS medial clause will normally be within the scope of the final clause in the clause chain for the categories of tense, mood and polarity. A subordinate medial clause, on the other hand, will not be within the scope of the final clause for these categories. This

diagnostic has been applied by a number of linguists to Papuan languages[10] to define SS/DS medial clauses as coordinate and not subordinate. In Roberts (1988a), however, I argued that these criteria do not adequately distinguish SS/DS medial clauses as coordinate in Amele. For example, with respect to tense, the category marked on the final verb applies to all the SS/DS medial verbs preceding in the clause chain. So in (122a) the today's past tense applies to *ho busaleceb* whereas in (122b) the future tense applies to this clause.

(122)a. *Ho busale-ce-b dana age q-oig-a.*
pig run.out-DS-3SG man 3PL hit-3PL-TODP
The pig ran out and the men killed it.

b. *Ho busale-ce-b dana age qo-qag-an.*
pig run.out-DS-3SG man 3PL hit-3PL-FUT
The pig will run out and the men will kill it. (Amele)

For a medial clause that is not marked for SS/DS, as in (123) for example, the tense specification can be different from that marked on the final verb. So in (123) the tense marked on *qoqagan* the subordinated verb is future, whereas the tense marked on *hoiga* the main verb is today's past.

(123) *Dana age ho qo-qag-an=nu h-oig-a.*
man 3PL pig hit-3PL-FUT=PURP come-3PL-TODP
The men have come to kill the pig. (Amele)

It is also the case that in coordinate structures in Amele tense can be independently specified on the different coordinate clauses. (124) is an example of two clauses conjoined with *qa* 'but'. In the first clause yesterday's past tense is marked on the verb and in the second clause future tense is marked on the verb.

(124) *Naus cum ho-i-an qa Aideg uqadec h-ugi-an.*
Naus yesterday come-3SG-YESTP but Aideg tomorrow come-3SG-FUT
Naus came yesterday but Aideg will come tomorrow. (Amele)

The same situation with tense dependency for SS/DS medial verbs also holds for mood and negation dependency. In (125a) the scope of the question particle *fo* includes the SS/DS medial clause. It is not possible to question this medial clause independently of the final clause, as in (125b).

(125)a. *Ho busale-ce-b dana age q-oig-a=fo?*
pig run.out-DS-3SG man 3PL hit-3PL-TODP=Q
Did the pig run out and did the men kill it?

b. **Ho busalecebfo dana age qoiga?* (Amele)

However, it is possible to question subordinate and coordinate clauses independently. In (126) an embedded indirect quote is questioned independently of the final clause and in (127) the second of two coordinate clauses can be questioned independently of the first clause.

(126) *Ho busale-i-a=fo sisil-te-i-a.*
pig run.out-3SG-TODP=Q ask-1SG-3SG-TODP
He asked me whether the pig ran out. (Amele)

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10 See, for example, Haiman (1980) on Hua, MacDonald (1983) on Tauya and Reesink (1984) on Usan.

(127) *Ho busale-i-a qa dana age q-oi-ga=fo?*
pig run.out-3SG-TODP but man 3PL hit-3PL-TODP=Q
The pig ran away but did the men kill it? (Amele)

The same principles also apply to the scope of negation in Amele SS/DS medial verbs. Negation can be marked on the verb by inflection and also by the negative particle *qee* 'not' preceding the verb. In a SS/DS medial clause chain when the final clause in the chain is marked for negation all the verbs in the clause chain are construed as negated, as in (128) for example.

(128) *Ho busale-ce-b dana age qee qo-l-oin.*
pig run.out-DS-3SG man 3PL not hit-NEGP-3PL
The pig did not run out and the men did not kill it. (Amele)

A subordinate clause, on the other hand, can be negated independently from the superordinate clause and, vice versa, a superordinate clause can be negated independently from a subordinate clause. In each case the scope of negation is limited to the level at which it occurs i.e. either the subordinate or superordinate level. Where there is a choice negation of the superordinate clause is preferred by native speakers. So (129b) is preferred to (129a).[11]

(129)a. *Dana age qee ho qo-wain=nu h-oig-a.*
man 3PL not pig hit-NEGF-3PL=PURP come-3PL-TODP
The men came not to kill the pig.

b. *Dana age ho qo-qag-an=nu qee ho-l-oin.*
man 3PL pig hit-3PL-FUT=PURP not come-NEGP-3PL
The men did not come to kill the pig. (Amele)

Coordinate clauses can also be independently negated, as in (130a)-(130b) for example.

(130)a. *Ho qee busal-el qa dana age q-oig-a.*
pig not run.away-NEGP.3SG but man 3PL hit-3PL-TODP
The pig did not run away but the men killed it.

b. *Ho busale-i-a qa dana age qee qo-l-oin.*
pig run.away-3SG-TODP but man 3PL not hit-NEGP-3PL
The pig ran away but the men did not kill it. (Amele)

In fact, with respect to negation, it is possible to negate a SS/DS medial clause independently from the final clause. Examples are given in (131)-(132) where a SS/DS medial verb is negated by *qee* but no negation inflection is marked on the final verb. Therefore only the SS/DS medial verb is negated in each case. This is another instance where the SS/DS medial clause has a marked subordinate function like the medial purpose and conditional clauses discussed above.

(131) *Ho qee bu-busal-en dana age qo-ig-a.*
pig not DUR-run.out-3SG.DS.SIM man 3PL hit-3PL-TODP
Before the pig ran out the men killed it. (lit. While the pig had not run out the men killed it.) (Amele)

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11 Presumably this is because Amele is a head-marking rather than a dependent-marking language and since the matrix clause functions as the head of the construction this is the clause that is preferred for negation marking.

(132) *Cuha osol qee he-do-co-b* *ija jobon* *cesel-i*
week one not finish-3SG.DO-DS-3SG 1SG village return-PRED
h-om.
come-1SG.REMP
When one week had not finished I came back home, i.e. before the week had finished I came back home. (Amele)

So in Amele, where a SS/DS medial clause is dependent on a final clause for its expression of tense, mode and polarity, this does not in itself determine whether the medial clause is in a subordinate or coordinate relationship to the final clause, since both subordinate and coordinate non-SS/DS clauses can be marked independently for tense, mode and polarity. In fact, it has been demonstrated how SS/DS medial clauses in Amele can occur in both coordinate and subordinate structures. So a clause does not have to be structurally embedded within another clause to be marked SS or DS. It is the dependency relationship and not the structural embeddedness that determines whether the tense, mode and polarity of a final clause has scope over a SS/DS medial clause. So SS/DS clause chains in Amele, and in other PNG languages too, can be analysed as endocentric constructions comprising a final clause as head and SS/DS medial clauses functioning as dependent elements. This structure is illustrated by Figure 16.

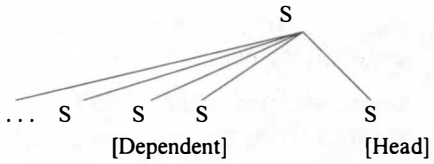

FIGURE 16: HEADED CLAUSE CHAIN STRUCTURES

SS/DS clause chains are the clausal equivalent of headed phrases, such as NP or VP. In a headed phrase constituent the head can occur as the sole exponent of the constituent. For example, a noun or a verb can occur as the sole exponent of NP or VP respectively. In the same way S can occur as the sole exponent of a clause chain. Also in a headed phrase the head and its dependent elements are on the same level structurally but the head determines any relationships of concord or government over or within the phrase. So in the English NP, for example, number is determined by the head noun but can be marked over the whole phrase, as in *this boy* (singular number) versus *these boys* (plural number). By the same token, in a clause chain construction like that in Figure 16, verbal categories such as tense, mode and polarity are normally marked in full on the final clause, which functions as the head of the chain, and then there is concord or agreement between the head clause and the preceding dependent clauses for these categories.

There is also the operation of government within a SS/DS medial clause chain. A given SS/DS medial clause is dependent on a following controlling clause for its SS/DS marking. The controlling clause may be a final clause or another SS/DS medial clause. The difference between concord and government is that under concord two or more clauses in the clause chain are 'inflected' for the same category, e.g. tense, mode and polarity, whereas under government the controlling clause and the dependent clause do not exhibit the same category; instead the marking of a particular category on the dependent clause is determined by the controlling clause with respect to the relevant category, e.g. SS or DS. However,

while it is clear that SS/DS is marked under a system of government between clauses it is not clear how this can be accounted for within a constituent structure based system of government as suggested by Finer (1985a, 1985b) under Government and Binding (GB) Theory. The dependent medial clauses marked for SS/DS lack the essential feature of being structurally embedded within the following controlling clause for GB principles to work. The configuration of a typical clause chain in Amele, such as that illustrated in (1) above, is given in Figure 17. The first S_{DS} is not embedded within the final S[+YESTP]. Neither are any of the other $S_{SS/DS}$ clauses embedded within their following controlling clauses.

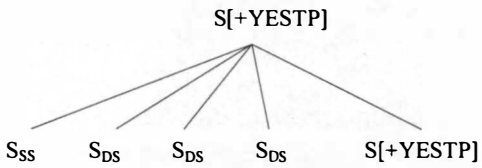

FIGURE 17: STRUCTURAL CONFIGURATION OF CLAUSE CHAINS

Another contribution to the coordinate-subordinate debate about medial clause chains is that of Longacre (1985). Longacre claims that there is a basic division in languages between those that are "co-ranking" (i.e. that make a clear distinction between subordinate and coordinate structures) and those that are "chaining" (i.e. that neutralise the distinction between subordinate and coordinate structures). Longacre (1983) bases this claim on analysis of data from Wojokeso, an Angan language of PNG, amongst other languages. In response to this claim I will present data from Amele and Angave, another Angan language, that subordinate and coordinate structures are differentiated formally within the clause chain structures of these languages.

In Amele SS/DS medial clauses can function as either subordinate or coordinate to a following controlling clause. Some examples are given in (133). In (133a)-(133b) the DS marked clauses function as nominalised object complements of the final verb, whereas in (133c) and (133d) the same clauses function in a coordinate relationship with the final clause. The DS clauses themselves, however, are unmarked for subordinate or coordinate function.

(133)a. *Uqa ho-co-b f-ig-a.*
3SG come-DS-3SG see-1SG-TODP
I saw him come.

b. *Uqa ho-ho-n f-ig-a.*
3SG DUR-come-3SG.SIM.DS see-1SG-TODP
I saw him coming.

c. *Uqa ho-co-b j-ig-a.*
3SG come-DS-3SG eat-1SG-TODP
He came and I ate.

d. *Uqa ho-ho-n j-ig-a.*
3SG DUR-come-3SG.SIM.DS eat-1SG-TODP
As he came I ate. (Amele)

We noted in §5 that in a number of languages the SS/DS system is sensitive to whether the subject of the controlling clause is semantically subordinate to the subject of the marked clause. It is also the case in Amele that the SS/DS system is sensitive to whether the controlling clause is structurally subordinate or not. In (134a) the first clause is acceptable only if it is marked as SS, since in this case the *uqa hohon* clause is subordinated to the final clause and the subject of the first clause is coreferential with the subject of the final clause. In (134b), on the other hand, the first clause is acceptable only if it is marked as DS, since in this case the *uqa hohon* clause follows in a coordinate relationship. It is the controlling clause for the SS/DS marking of the first clause and is not coreferential.

(134)a. *Ija bili-m-ig (*bile-ce-min) uqa ho-ho-n f-ig-a.*
1SG sit-SS-1SG (sit-DS-1SG) 3SG SIM-come-3SG.DS see-1SG-TODP
I sat and I saw him coming.

b. *Ija bile-ce-min (*bili-m-ig) uqa ho-ho-n j-ig-a.*
1SG sit-DS-1SG (sit-SS-1SG) 3SG SIM-come-3SG.DS eat-1SG-TODP
I sat and as he came I ate. (Amele)

Angave (Speece 1985) is another language which has SS/DS medial clauses that can function in a subordinate relationship to a following clause. In (135) the first clause functions as a nominal object complement of the verb in the second clause. It is also the case in Angave that the SS/DS system is sensitive to whether the controlling clause is in a subordinated relationship to a following clause. An example is given in (136) where the clause *íwo bariŋagi* 'son coming.3SG' is subordinated to the following clause. This is indicated by the SS marking on the preceding clause.

(135) *Ará y-ari-ŋ-ag-wi siŋwí neaniníárini.*
weed do-CONT-SIM-DS-1PL eye 1PL.DO-will.see.3PL
They will see us weeding. (Angave)

(136) *Í abiá wío riá ni-yea-r-i íwo bariŋagi*
she potato one.of.two.M fire SS-cook-?-3SG son coming.3SG
ni-w-ini-ri n-iwi-r-i ...
SS-3SG.DO-see-?-3SG SS-remove-?-3SG
She cooked one of the two potatoes and saw that her son was coming and took it out of the fire ... (Angave)

These data therefore contradict Longacre's claim that the coordinate versus subordinate distinction is neutralised in clause chaining languages. The distinctions are still there in Amele and Angave clause chains and are marked by the SS/DS system in each case.

In Australian languages, according to Austin (1981), the subordinate marked clause can precede or follow the main controlling clause. In PNG languages the ordering appears to be more rigid and the unmarked ordering is invariably marked clause before controlling clause. The exceptional cases are when the SS/DS medial clause has a subordinate function rather than a coordinate function, as in the Amele examples cited above.

7. SYSTEMS OF SS/DS

Jacobsen (1983) suggests the possibility of different systems of SS/DS marking based on their occurrence in different clause types. For example, a number of North American Indian

languages have different SS/DS markers in relative clauses. Most of the PNG languages in the survey had only one system of SS/DS marking. Several, however, had what could be said to be more than one system. Differences in SS/DS systems could be viewed in either formal or functional terms.

It has already been mentioned in §3.1 that Baruya (Lloyd 1984) was the only language described as having a special SS/DS marking for relative clauses (RCs). In Baruya regular SS is marked by the suffix *-a(no)* and DS is marked by the prefix *ka-*. However, for a RC that has a coreferential subject with the following clause a special SS marker is employed, *-e*, as illustrated in (137).

(137) *Y-en-e-i* *ny-iro.*
do-1SG.SEQ-SS.RC-M 1SG-be
I am the man who worked. (Baruya)

With regard to RCs a number of writers on Papuan languages, such as Bruce (1984) on Alamblak and Reesink (1987) on Usan, say that in these languages SS/DS cannot be marked on RCs. However, in a language like Amele it is quite possible to mark SS/DS on a RC. (138) gives an example of SS marking on a RC and (139) gives an example of DS marking on a RC. The H(ead) N(oun) that is relativised on is identified for each RC. In each case the RC is preceded by a clause marked SS which does not refer to the HN in the RC but rather to the subject of the clause following the RC. The meaning of the undefined abbreviation is IT(erative aspect).

(138) *Jobon=na ti-me-i* [[HN *ahul* *susu=ca* *ma* *susu=ca* *ilal*
village=to go.up-**SS**-3SG coconut scraps=with taro scraps=with chaos
] RC] *q-oc* *ta-taw-en* *fi-me-i* *eu* *ji-ji* *nij-en.*
hit-NOM DUR-stand-3SG.SIM.DS see-**SS**-3SG that eat-IT lie-3SG.REMP
He went up to the village and then he stayed and ate the coconut and taro scraps that he saw lying about. (Amele)

(139) *Mi he-du-me-i* [[HN] *ceta* *wal* RC] *me-ce-b* *ceta* *eu* *huni-me-i* ...
put finish-3SG.DO-**SS**-3SG yam ripe become-**DS**-3SG yam that dig up-SS-3SG
He finished doing that and then dug up those yams that were ripe ... (Amele)

However, the possibility of marking SS/DS in a RC was noted only in Baruya and Amele. It would therefore be imprudent to make any generalisations on such a meagre database. In the case of purpose clauses, another type of subordinate clause, more data were available. Recall that in several languages SS/DS can be marked in purpose clauses. In Agarabi and Kobon PURP can be marked on the SS medial verb and in each case a particular morpheme marks PURP.SS. In Kobon this produces a formal as well as a functional difference since the regular SS/DS distinction is marked by different sets of MarkSu. In three other languages, Fasu, Usan and Ömie, PURP can be marked on both SS and DS verbs. Again in each case the markings are formally different from the regular SS/DS markings. In Ömie a PURP.SS/DS clause can also occur following the controlling clause. The relevant example is reproduced as (140).

(140) *Na ie ujuoho rue-ˈejô nô i-ˈiröhe-go.*
1SG food bring will-come.FUT.1SG 1PL eat-FUT.1PL-PURP.DS
I will bring food for us to eat. (Ömie)

On the basis of these data there would be some justification in positing that SS/DS marked on purpose clauses (and perhaps subordinate clauses in general) is formally different from that marked on coordinate clauses.

In §3.7 five languages, Irumu, Yupna, Yau, Nend and Apalɨ, were described which mark both DS and SS on the same verb for various functional purposes. The point was made that this actually constitutes a trinary set of distinctions between SS, DS and DS+SS, quite distinct from the normal binary system of SS versus DS. In Irumu, Yupna, Nend and Apalɨ the same markers that coded 'regular' SS/DS also coded DS+SS, so for these languages one could say this was an extended function of the regular SS/DS system. In Yau, however, there were two different DS MarkSu forms, namely <*-a*> and <*-maina*>, and the second was used to code the DS+SS function of referential overlap. So in Yau there is a formal as well as a functional distinction made in SS/DS marking for referential overlap, a subordinating function.

In §3.1 several languages were described that have more than one medial verb type based on the set of suffixation each type can take. For example, Kuman, Chuave and Hua have one MV type that can be marked for SS/DS and another MV type that cannot. In Hua, according to Haiman (1980), the MV clause type that has the SS/DS marking is in a coordinate relationship with the following clause while the MV clause type that does not have the SS/DS marking is in a subordinate relationship with the following clause. Thurman (1975) describes Chuave as having two different types of medial verb. One carries the regular SS/DS markers *-ro* and *-goro* respectively and the DS form is also marked for MarkSu agreement. The other medial verb, which Thurman terms "dependent", can be marked for a range of categories including MarkSu agreement, negation, realis versus irrealis modality and SEQ versus SIM. It is also marked distinctively by *-g*. Thurman maintains that the function of this clause marking is to indicate that this clause and subsequent clauses are backgrounded. The backgrounding terminates with another *-g* clause. Thurman also maintains that the *-g* clause does not indicate DS even though the *-g* obviously resembles the DS marker *-goro*. Examples (141) and (142) are taken from Thurman (1975).

(141) *the older brother said-re (SS) "I'll go" / and [while] he was going-gui (DEP-SIM) between Chimbu and Hagen / a crazy man was there-ro (SS) and / early in the morning [he] came-re (SS) / and stood-re (SS) there / and [while] he was standing-gui (DEP-SIM) there / he [older brother] came-goro (DS) / and ...*

(142) *[We men] cut out-ro (SS) the backbone / and laid-ro (SS) the skull / and [after] we had taken out-gai (DEP-SEQ) the insides / and had given-ga (DEP-SEQ) [them] / and went-ro (SS) to the water / and [they] wanted to do-ro (SS) [this] / and [they] took-ro (SS) [them] / and [after] they had walked-gua (DEP-SEQ) away / [we] waited-ro (SS) / and we covered the meat (final verb).* (Chuave)

However, in a language like Irumu, which has the DS+SS marking, a string of clauses can be bracketed off as background by using a DS+SS verb to mark the beginning and the end of the backgrounded sequence, as in (143) for example.

(143) *Täŋ-Pä-kaŋ ämа kumbä tä bänep wakwak man ätu*
do-3PL.**DS-SS** man one ERG liver bad talk some
yä-weT-Pän-kaŋ metäŋ-peŋ kuŋ-na yäŋ-kaŋ täŋ-Ku-ŋ.
3PL.O-tell-3SG.**DS-SS** run-SS go-1PL say-SS do-REMP-3PL
They were doing that and then (because) a man came and got cross at them they said, "Let's run away," and did that. (Irumu)

Therefore, while Thurman is correct in saying the MV marked with *-g* does not indicate DS, i.e. different grammatical subject, in the same way the other MV does in Chuave, it does in fact have the same function as the DS+SS marked MV in Irumu. It would be possible to say that Chuave has two SS/DS systems, one of which indicates same versus different subject and one of which switches between backgrounded and foregrounded events. In any event background information is normally expressed in subordinate clauses. So here again there are examples of languages with formal differences between subordinate and coordinate medial clauses.

Another approach in distinguishing different systems of SS/DS is to look at their different functions as well as their different formal properties. In Angaataha (Huisman 1973) medial verbs marked for same subject can be further marked for same or different place. Same subject is marked by a set of agreement markers particular to this form of the verb. Same place is indicated by the morpheme *-té* (144a) and different place is indicated by the morpheme *-mé* (144b).

(144)a. *Áhew-isa-té émpîm-ô.*
put down-1SG.SS-SAME.PLACE sit.down-1SG.R
I put him down and sat down (there).

b. *Áhew-isa-mé nunté émpîm-ô.*
put down-1SG.SS-DIFF.PLACE go sit.down-1SG.R
I put him down, went and sat down (elsewhere). (Angaataha)

So in Angaataha the basic SS/DS system is augmented to mark same and different place. In a language like Amele, however, which lacks overt markers for same and different place, the regular SS/DS system is sensitive to this change. In (145) the subjects of *guldocobil* and *tacein* are the same but DS is marked on the first verb because of the change of place setting.

(145) *Age ceta gul-do-co-bil li bahim=na tac-ein.*
3PL yam pull.up-3SG.DO-**DS**-3PL go(SS) floor=on fill-3PL.REMP
They pulled up the yams and then went and filled up the yam store. (Amele)

It seems that in Nankina (Spaulding 1988) the regular SS/DS system is sensitive to a change in place setting. In Nankina referential overlap is normally coded as SS so in an example like (146) the verb in the first clause should be marked for SS. However, the DS on this verb indicates that one of the participants is moving to another place setting.

(146) *Nin komu-ŋan t'pM-NA-na git nʌ-pM-ŋ ku-kWit.*
1PL river-LOC be-PFV-**DS** 2PL 1SG.DO-leave-SS go-REMP.1PL
We stayed at the river and then you left me and we went. (Nankina)

Bromley (1981:239) reports that in Dani (a Papuan language spoken in Irian Jaya) the SS/DS system is sensitive to a change in time setting. The SS/DS markers in Dani are *-yk* for

SS.SEQ, *-lokolyk* for SS.SIM, *-nem* for DS.SEQ and *-kkolek* for DS.SIM. In (147), although the subjects of *wakvnemhe* and *wateka* are the same, the first verb is marked as DS to indicate a change of time setting.

(147) *Svppvtv ta'luk wakv-nem-he ... wateka.*
sweet.potatoes having.dug comes.3PL-**DS-TOPIC** they.injured.themselves
When they were bringing the sweet potatoes they had dug they fell and injured themselves. (Dani)

In a language such as Amele the SS/DS system is also sensitive to changes in time setting, as illustrated by (148) where the subject of all the verbs remains as *ma* 'taro' throughout but *ibuldocob* is marked as DS to indicate the change in time setting.

(148) *Ma ben mi-me-i gulom ibul-do-co-b wal mi-me-i ...*
taro big become-SS-3SG taro.type change-3SG.DO-**DS**-3SG ripe become-SS-3SG
The taro grows big and then when it changes into a gulom type it is ripe ... (Amele)

It also appears to be the case that the SS/DS system in Botin is sensitive to changes in time setting. Example (149) is taken from Pryor (1990:8). The meanings of the undefined abbreviations in (149) are: F(ar)D(deictic).P(lural), COMP(leted aspect), EXCL(usive), N(eutral) T(opic), CONT(inuous aspect), INC(complete aspect), N(on)F(uture).D(ifferent)-S(ubject), N(ear) D(eictic), O(blique)2 and M(id)D(eictic). Notice that the subjects of the verbs *tal* 'do-NF.DS' and *lekap* 'FD.P-CT-put-COMP' are first person exclusive in each case, yet *tal* is marked as a different subject verb. This is most likely because there is a clear change in time setting indicated by the time word *miña* 'now(NEG)'.

(149) *Gayi li-ba aka-k-ip-al ni-ba li-n bo-l-a*
steel.axe FD.P-NT arrive-put-COMP 1PL.EXCL-NT FD.P-O2 work-CONT-INC
t-al miña ga-n ni-ba la-n tomon
do-NF.**DS** now(NEG) ND-O2 1PL.EXCL-NT FD.P-O2 stone.axe
l-e-k-ap m-a.
FD.P-CT-put-COMP MD-NT
Since steel axes arrived, we work with them; now we have forsaken stone axes. (Botin)

As well as being sensitive to changes in place and time setting the SS/DS system in Amele is also sensitive to changes in world setting. In (150) there is a change from the real world to an unreal world of intended action indicated by the DS marking on *madocomin* even though the subject of the following verb is still first person singular. The text is brought back to the real world of the discourse with the recapitulation clause *Odocob*. This clause picks up the reference from the preceding final clause. The SS/DS marking on the verb *odo-* 'do' should therefore be SS, since the subject of this clause is coreferential with both the preceding final clause and the following controlling clause. However, it is marked DS to indicate the change in world setting.

real → intent.

(150) *Aria memeg eu madon, "Cois eu ma-do-co-min l-ig*
alright father that told.her OK that say-3SG.DO-**DS**-1SG go-1SG(SS)

intent. → real

ehi li m-ih-ig-en," don. Odo-co-b li-me-i dana
take(SS) go(SS) put-2SG.DO-1SG-FUT told.her do-**DS**-3SG go-SS-3SG man

co afa q-oc eu madon, "Cois caja ehi li
mouth close hit-NOM that told.her OK woman take(SS) go(SS)

m-ud-i-h-ig-en," don.
put-3SG.DO-PRED-2SG.OO-1SG-FUT told.her

Alright the father told her, "OK I say I will take you and give you to him." Then he went to the man with the closed mouth and told him, "OK I will bring the woman and give her to you." (Amele)

According to Olson (1981) Barai has two morphologically distinct SS/DS systems, one of which monitors the NP argument of the verb termed "pragmatic peak" and one of which monitors the thematic topic as described by Olson, who likens this to Halliday's notion of theme. Table 20 details the forms of the two SS/DS systems in Barai.

TABLE 20: BARAI SS/DS MARKERS

		SS	DS
Pragmatic Peak:	SEQ	*-na*	*-mo*
	SIM	*-kinu*	*-ko*
Thematic Topic:	SEQ	*-gana*	*-moga*
	SIM	*-gana*	*-koga*
	UNSPEC	*-gana*	*-ga*

The theme can be monitored independently from the pragmatic peak in Barai by the two SS/DS systems, as illustrated by (151a)-(151c). The meanings of the undefined abbreviations are S(ame)T(opic) and D(ifferent)T(opic).

(151)a. *Fu vua kuae-ga siare ije, fu naebe ume.*
3SG talk say-DT betelnut DEF 3SG NEG chew
He$_i$ was talking and, as for betelnut, he$_i$ did not chew it.

b. *Fu vua kuae-ko-ga siare ije, fu naebe ume.*
3SG talk say-DS-DT betelnut DEF 3SG NEG chew
He$_i$ was talking and, as for betelnut, he$_j$ did not chew it.

c. *Ve ije, fu barone-ko-gana bu Sakarina ij-ia va.*
time DEF 3SG die-DS-ST 3SG Sakarina DEF-L go
At the time, he was dying and (at the same time) they were going to Sakarina. (Barai)

In this section we have explored different systems of SS/DS found in some PNG languages. The data available seem to corroborate Jacobsen's hypothesis that SS/DS is marked differently in subordinate clauses from coordinate clauses, although the basic

function is still the same, i.e. to mark a binary distinction of SS versus DS. In some languages a trinary distinction is marked of SS, DS and DS+SS. In most cases this is associated with referential overlap of subject-NPs but in Irumu this form is used to background information, a subordinating function.

The different functional properties of SS/DS systems within some languages were also examined. Here we found that the canonical 'same subject' versus 'different subject' morphology can be functionally extended in a number of languages to indicate changes in other deictic discourse categories, such as foregrounded versus backgrounded events, same-place-setting versus different-place-setting, same-time-setting versus different-time-setting, and same-world-setting versus different-world-setting. However, one then has to decide if these discourse-pragmatic functions are anomalous or if the same versus different subject category is just the most prominent category of discourse deixis and the one that receives the most attention from a SS/DS system.

8. ORIGINS OF SS/DS IN PNG LANGUAGES

SS/DS marking in PNG languages is extremely heterogeneous so any attempt to find origins or reconstruct protoforms is an onerous task. However, some proposals have been made and the viability of these will be discussed in this section. Perhaps the most credible theories of origins are those proposed by Haiman (1983, 1987, 1991). In Haiman (1983) he proposes two possible origins for SS/DS marking in some Papuan languages, particularly those of the Gorokan and Kainantu language families. The first possibility is based on the familiar syntactic process of coordinate reduction or gapping,[12] i.e. the deletion of a repeated element in conjoined clauses, and the fact that some Papuan languages exhibit a pattern in their SS/DS marking similar to the following:

SS = Verb + ∅

DS = Verb + MarkSu (= Final Verb)

The hypothesis is that there has been a deletion of person and number markers on the preceding verb when the subject is identical with that of the following verb. The only problem with this theory, as Haiman himself admits, is that very few Papuan languages actually exhibit this pattern in its pure form. Haiman cites Ono as the only language known to him that marks SS/DS precisely like this. There are a number of other languages that come close but they either have an additional morpheme for indicating DS or the MarkSu is not the same as for the final verb form. In the present survey only nine languages were found that marked SS with ∅ and DS with MarkSu.

The second, more promising proposal by Haiman is based on the fact that a number of PNG Highland languages mark the SS/DS distinction after the pattern shown below, i.e. mark DS with a distinctive morpheme that has the phonological shape of velar stop + vowel (*KV):

SS = Verb + MarkSu + ∅

DS = Verb + MarkSu + *KV

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12 The term 'gapping' is used in generative grammar to refer to deletion of the verb across coordinate structures but Haiman uses the term for deletion of the person and number markings on the verb.

It was noted in Table 6 that this morpheme, *KV 'DS', was widely spread and shows up in the Chimbu, Gorokan, Koiarian and even South Bougainville language families. Haiman (1987) also notes that in many of the languages of the Gorokan and Koiarian families the conjunction that coordinates NPs, i.e. 'and', has a phonological shape very similar to *KV. Haiman's hypothesis is that in the Gorokan languages the medial DS marking has arisen from a process of synthesis of the MarkSu morphemes and a following coordinate conjunction 'and'. This origin for DS marking may also apply in the other language families already mentioned and it may even apply to Amele, a language genetically and geographically quite removed from the Highland languages. In Amele the DS marker is *-ʔe≈ -ʔo* and the coordinating conjunction for NPs is *ʔa* 'and'.

Givón, on the other hand, argues that SS/DS markings in PNG Highland languages have a pronominal origin on the basis of the formal means that are employed in languages to indicate topic continuity:

> The SS/DS morphological contrast attached to the verb of the *preceding* clause in languages such as Chuave or Hua, i.e. with *anticipatory* SR morphology, may arise diachronically from a contrast of subject pronouns in the *succeeding* clause. This morphological contrast – either between stressed versus unstressed pronouns or pronouns versus zero, respectively, merely became *cliticised* on the preceding verb, given the strict SOV typology of these languages (Givón 1983:78).

In effect Givón claims that the *-ga* 'DS' in Hua and the *-go(ro)* 'DS' in Chuave must have a pronominal origin in order to have a present "pronominal" function. However, there is no evidence that these markers have a pronominal origin; rather the evidence suggests that they either originated from conjunctions in these languages or were borrowed as fully functioning DS markers. Indeed from the available evidence SS/DS markers have arisen from a variety of sources in PNG languages, none of which appear to be pronominal.

For example, for Daga (Murane 1974) the DS marker *-wa* functions as a nominaliser clitic and occurs obligatorily at the end of all NPs and optionally at the end of nominalised clauses and DS medial clauses. So the DS marker in Daga still retains some of its original function, i.e. as a nominaliser. In Usan (Reesink 1987) the SS markers are also verb classifiers which divide the verbs up into seven basic morphological classes. In Siroi the SS marker *-mba* can be analysed as the verb 'to ascend' + the dependency marker *-a* according to Reesink (1981) and Van Kleef and Van Kleef (1988). For the one AN language in PNG with a SS/DS system, Dami, evidence was presented that the markers of SS/DS were originally realis versus irrealis markers which have been adapted to fulfill a completely different function under the influence of the surrounding Papuan languages. The only place where a pronominal origin appears to apply in the area of SS/DS marking is with respect to AnticSu marking. It was noted that this morphology in Benabena and Fore, for example, is probably derived from personal pronouns since the AnticSu markers resemble the possessive pronoun forms in these languages rather than subject agreement markers. However, it was also noted that although AnticSu markers occur extensively in languages of the Gorokan and Kainantu language families in only two of these languages could it be said that the AnticSu markers actually indicate a SS/DS distinction. In most cases the AnticSu morphology functions independently of the SS/DS morphology.

Research on the origins of SS/DS systems in PNG languages is still at a very early stage so definite conclusions cannot be drawn. However, one thing seems to be obvious about

languages in PNG and that is that historically they have influenced each other heavily through language contact. For example, I have already cited the work of Ross (1987) who shows how the Austronesian languages of the Belan subfamily in Madang have taken on SOV word order and developed a medial versus final verb distinction under the influence of the neighbouring Papuan languages. One of these languages, Dami, has gone a stage further and developed a SS/DS system. This would seem to be for the obvious reason that this Austronesian language group has moved inland from the coast and is now surrounded by Papuan language groups. So it is not unusual in PNG for languages of completely different genetic origins to influence each other heavily in both areas of morphosyntax and lexicon. This type of language change is usually brought about through bilinguals, who through interference from the structures of their native language produce innovative forms in the second language they speak, which are then assimilated by the native speakers of the second language. By such a process of calquing a whole morphosyntactic system like switch-reference can be passed on from one language group to the next. However, the form that is used to express this function may be very different in each particular language.

As to where SS/DS came from originally in PNG then it would not be unreasonable to speculate that it first developed in the Gorokan languages and from there spread out through some process of morphosyntactic diffusion to cover most of PNG. There would be two pieces of evidence in favour of such a speculation. Firstly, a common form for expressing DS, *KV, can be traced from the Gorokan languages to the Chimbu languages in the north-west and to the Koiarian languages in the south-east. Secondly, many of the Gorokan languages have developed an additional AnticSu system which adds further to the redundancy of the SS/DS system. Since a system of SS/DS would have to be in place before a system of SS/DS + AnticSu could develop, then it would follow that systems of SS/DS + AnticSu would predate systems of just SS/DS. In any event a lot more research needs to be done in PNG languages before we are able to make any definitive statements about origins of SS/DS in these languages.

9. CONCLUDING SUMMARY

The characteristics of SS/DS in PNG languages are very similar to the characteristics of SS/DS found in Australian Aboriginal and North American Indian languages, but there are significant differences.

Geographically SS/DS in PNG shows the same areal pattern of dispersion across languages as in Australian and North American Indian languages and is spread over an almost continuous area on the PNG mainland across languages that are genetically widely diverse. This included one Austronesian language, Dami, that is geographically surrounded by Papuan languages with SS/DS systems. Dami syntax has apparently been restructured to SOV word order to accommodate the alien SS/DS system. Whether the dispersion of SS/DS in PNG is a product of genetic inheritance or morphosyntactic borrowing depends on the validity of the TNGP hypothesis.

On the one hand, the geographical dispersion of SS/DS in Papuan languages matches the TNGP very closely. This gives credibility to the TNGP hypothesis itself and it also suggests that the dispersion of SS/DS in Papuan languages has a genetic explanation. On the other hand, however, there is evidence that morphosyntactic diffusion has influenced the spread of SS/DS in Papuan languages. For example, many languages belonging to the Sepik-Ramu

phylum in the Madang and Sepik areas of PNG have SS/DS marking when this phylum is not reckoned to belong to the TNGP. If the Sepik-Ramu phylum does not belong to the TNGP then these languages could not have obtained their SS/DS markings genetically. Also there are some Papuan languages, such as those belonging to the Torricelli phylum and New Britain stock, which appear to be heavily influenced by Austronesian morphosyntax. These languages have Austronesian features like SVO word-order, pronoun prefixes to the verb, simple verb morphology, and noun classes. They also lack any SS/DS marking. This is clear evidence that the morphosyntax of Papuan languages can change radically under the influence of an alien system. It is probably the case, therefore, that the present disperson of SS/DS marking in Papuan languages is due to a combination of genetic inheritance and morphosyntactic diffusion.

The means of marking SS/DS in PNG languages was found to be extremely heterogeneous. Seven different mechanisms for marking the SS versus DS distinction were observed:

(i) SS = ∅, DS = invariable morpheme

(ii) SS = invariable morpheme, DS = ∅

(iii) SS = invariable morpheme, DS = invariable morpheme

(iv) SS = ∅, DS = MarkSu

(v) SS = invariable morpheme, DS = MarkSu

(vi) SS = MarkSu_i, DS = MarkSu_j

(vii) SS = not AnticSu, DS = AnticSu

The most common of these patterns in the sample were (iii), 45%, and (v), 30%. For some of these mechanisms it becomes questionable as to whether the SS/DS distinction is really marked or not. For example, with mechanisms (iv) and (v) where DS is indicated by MarkSu and the MarkSu morphology is the same as on the final verb, then DS is not marked, only SS.

As well as these different mechanisms applying across languages, with some languages more than one of these operate for the SS/DS system. For example, Amele uses mechanism (ii) for its SEQ verbs and mechanism (v) for its SIM verbs and Kobon uses mechanism (v) for its non-purpose clauses and mechanism (iv) for its purpose clauses. While the majority of PNG languages have a morpheme that is not a subject agreement marker to mark the category DS over 20% do mark this category solely by subject agreement. This would appear to be significantly different to the marking of SS/DS in Australian and North American Indian languages where these categories are marked almost exclusively by non-subject agreement morphology. Another major difference in PNG SS/DS marking is the presence of some languages that mark the category DS by anticipatory subject agreement, although in most cases there is additional morphology for marking DS. The AnticSu morphology would appear to be an extra mechanism of redundant marking that the languages of the Gorokan and Kainantu language families in particular have adopted additionally to a SS/DS system.

It is also the case that, whereas in many North American Indian languages SS/DS is often marked on anaphoric particles which are independent of the verb, only in a few PNG languages was it found possible for the SS/DS marking to occur on a non-verbal item.

However, in each instance where this did occur it was the case that the marking was on a pro-clausal substitute.

One phenomenon found in PNG SS/DS that has not been noted elsewhere, as far as I know, is the marking of both DS and SS morphology on the same verb. This produces a trinary distinction of SS, DS or DS+SS and occurred in five languages: Irumu, Yupna, Yau, Nend and Apali. The main function of this device in these languages is to indicate referential overlap between the subject of the marked clause and the subject of the controlling clause, although it had other functions as well.

With regard to the categories that regularly co-occurred with SS/DS marking it was found that by far the most common category was the relative tense distinction of sequential versus simultaneous tense. This occurred in over 60% of the languages with a SS/DS system. In each case the SEQ versus SIM distinction was only marked on the medial verb and not on the final verb. However, some languages, namely Dadibi, Bahinemo, Sanio, Golin, Sinasina and Rumu, were found to have medial verbs with a SEQ versus SIM distinction but no SS/DS system. The question with these languages is: are they languages that have lost a SS/DS system, or are they languages that have the prerequisites to receive a SS/DS system? With no diachronic data available it is difficult to decide. We noted, however, that in the case of the AN Bel languages, Takia, Gedaged and Bilbil, they have developed medial verb systems with a SEQ versus SIM distinction under the external influence of the neighbouring Papuan languages yet have not developed a SS/DS system. The Bel language, Dami, on the other hand has gone further and developed a SS/DS system. Another common categorical distinction made on SS/DS medial verbs was that of PUNC versus DUR aspect, although it was mainly restricted to languages of the Binandere and Huon families. It was argued that this distinction is probably best understood as a subcategory of SIM tense rather than as a separate aspectual category.

In Australian and North American Indian languages it is common to have SS/DS marked on all non-final clause types, i.e. coordinate, adverbial, nominal and relative clauses. In many descriptions of Papuan languages I found that SS/DS marking on coordinate clauses was the only type described and illustrated. Often no mention was made as to whether SS/DS marking could occur on adverbial, nominal or relative clauses in the language. In a few instances investigators specifically said that SS/DS cannot occur on relative clauses. Yet, examples were found elsewhere of SS/DS marking on relative clauses as well as on other types of subordinate clause such as purpose, conditional and nominal clauses. There was even at least one language found, Fasu, that could mark SS/DS on 'lest' clauses. This is interesting since Austin (1981:311) noted that for Australian languages he did not know of any cases of SS/DS marking on 'lest' clauses. More investigation would seem to be necessary for PNG languages in the area of SS/DS marking on subordinate clauses.

In all the languages in the survey it was found that the nominal that the SS/DS system referred to was invariably the syntactic subject, even for those languages which had nominal ergative case marking. However, in §5 it was argued that SS/DS systems in PNG languages can be diagnosed as being either agent- or topic-oriented. For example, Alamblak has a purely agent-oriented SS/DS system and Barai has a purely topic-oriented SS/DS system. A number of other languages with split-S impersonal verb forms were investigated and it was found that these forms produced an asymmetric SS/DS marking which tracked the notion of NP[±TOPIC] across clauses. Both in the cases of accusative and ergative impersonal clauses it was demonstrated that the SS/DS asymmetry indicated that the SS/DS system was

registering the difference between the topicality status of NPs across clauses. When the accusative impersonal clause is the controlling clause the promoted P-role argument is coreferenced with the subject of the preceding split-S clause as SS, i.e. as having the same topicality status. In contrast, when the ergative impersonal clause is the controlling clause the promoted A-role argument is coreferenced with the subject of the preceding split-S clause as DS, i.e. as having a different topicality status. It was also argued that the asymmetric SS/DS mechanism functions in conjunction with the accusative and ergative impersonal verb forms to simulate the grammatical function changing devices of passivisation and antipassivisation respectively.

It was also shown in §5 that the asymmetric SS/DS marking applicable to impersonal clauses has been extended in a number of languages to cover all clause types such that it can indicate the topicality status of subject NPs across all clause types. In some cases topicality was decided on the inherent qualities of the subject nominal itself. So a [+HUMAN, +ANIMATE] nominal is deemed more topical than a [–HUMAN, +ANIMATE] nominal and a [+ANIMATE] nominal more topical than a [–ANIMATE] nominal. However, in other cases topicality was decided independently of the inherent qualities of the subject nominal in the controlling clause, since one [+HUMAN, +ANIMATE] nominal could be selected as more topical than another [+HUMAN, +ANIMATE] nominal. This function of SS/DS therefore resembles the 'fourth-person' systems found in some North American Indian languages which have two categories of third person traditionally labelled 'proximate' and 'obviative'. Proximate is characterised by Bloomfield (1962:38) as follows:

> The proximate third person represents the topic of the discourse, the person nearest the speaker's point of view, or the person earlier spoken of and already known.

The selection of the proximate nominal is discourse-conditioned and not affected by the inherent qualities of the nominal. SS/DS in PNG languages, however, is different from fourth person systems in that under SS/DS topicality can be assigned to a nominal with any person category. From the languages investigated it seems that for most languages in PNG with an SS/DS system this system is topic-oriented rather than agent-oriented.

In §6 we developed Jacobsen's (Jacobsen 1983) suggestion that there might be different systems of SS/DS marking based on their occurrence in different clause types, namely coordinate versus subordinate. Jacobsen actually referred to relative clauses as a possible subtype for SS/DS marking but it was found that the marking of SS/DS on relative clauses in PNG languages is quite rare. However, it was found that other types of subordinate clause, such as purpose clauses, can be marked by SS/DS in PNG languages and that in most cases this is done by a different formal system than that used in the particular language to mark coordinate clauses. So there may be some empirical support for a coordinate versus subordinate distinction in SS/DS systems. It was also found that in a number of languages the canonical 'same subject' versus 'different subject' morphology has been functionally extended to indicate changes in other deictic discourse categories, such as foregrounded versus backgrounded events, same-place-setting versus different-place-setting, same-time-setting versus different-time-setting, and same-world-setting versus different-world-setting. This is further evidence that SS/DS is basically a topic tracking device rather than a subject tracking device.

For Australian languages Austin (1981) reports that the subordinate marked clause can precede or follow the main controlling clause. In PNG languages, however, the ordering

appears to be more rigid and the unmarked ordering is nearly always marked clause before controlling clause. With respect to Longacre's claim that in languages with a clause chain structure the distinction between subordinate and coordinate structures is neutralised, data were presented in §7 showing that in the Amele and Angave languages this is not the case. In these languages the SS/DS system is able to distinguish between subordinate and coordinate structures within the clause chain itself.

Some proposals by Haiman and Givón concerning the origins of SS/DS systems in PNG languages were discussed. Both Haiman and Givón focussed mainly on the Gorokan languages. Haiman's suggestion of an origin for the DS marker in a number of these languages based on the coordinate conjunction *KV seems to have some merit. However, just how this form with a DS function has developed in each of these languages is yet to be determined. There would appear to be no evidence, however, for Givón's suggestion that this marker must have a pronominal origin because of its nominal referential function.

10. LANGUAGES CITED

All the languages cited in this survey of switch-reference in PNG are listed in Appendix 3 in alphabetical order. All the languages listed are Papuan except for Dami which is an Austronesian (AN) language. The columns indicate whether the language has a SS/DS system or not, ±SR, the language family to which the language group belongs, the provincial location in PNG and the sources from which the information was gleaned.

APPENDIX 1: SS/DS MARKINGS AND ORDERINGS

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Ok family (Western) - Mountain								
Telefol		*-nV*	*-bV* *-sV* *-kV*	SS/DS		SS/DS +MarkSu		
Mianmin		*-n*	*-b* *-s* ∅	SS/DS		SS/DS +MarkSu		
Tifal		*-d*	DUR *-bad* PUNCT *-sad*	SS/DS		SS/DS +MarkSu		
Faiwol		no SS/DS						
Wagarabai, Setaman, Kauwol, Bimin, Ngalum: no information available								
East Strickland family (Southern Highlands)								
Samo		*-gwe*	*-bo* *-ba*					
Kubo, Bibo, Honibo, Tomu: no information available								
Inland Gulf family (Western)								
Kamula		SEQ *-me* *-po* SIM *-mama*	SEQ ∅ SIM *-lati*					

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
West Kutubuan family (Southern Highlands)								
Fasu		SEQ *-ka* *-raka* SIM *-pe* PURP *-ako* LEST *-paka*	SEQ *-(ho)ane* *-rakano* *-rakasapo* *-rakasupo* SIM *-mo* *-sekeno* PURP *-hoasimo* LEST *-akohoamo*					
Some, Namuni: no information available								
Teberan family (Gulf)								
Dadibi		no SS/DS						
Podopa		*-dɔ*	*-pa*					
Tebera: no information available								
Yuri family isolate (West Sepik)								
Karkar-Yuri		∅	*-nko*					
Senagi family (West Sepik)								
Anggor		∅	SEQ *-ambo* SIM *-ane*	SS/DS	DS	MarkSu +DS +AnticSu		
Dera, Duka-Ekor: no information available								

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Baibai family (West Sepik)								
Nai (Biaka)		SEQ *-ko* SIM *-nali*	SEQ *-i* SIM *-li*	SS/DS (SEQ)	SS/DS	MarkSu +SS/DS +AnticSu		
Baibai: no information available								
Nukuma family (East Sepik)								
Washkuk (Kwoma)		SEQ *-chi* SIM *-niga*	*-k*					
Kwanga		*-ni*	*-wani*	SS/DS				
Ndu family (East Sepik)								
Ambulas (Abelam)		SEQ *-e* *-takne* SIM *-te* *-kere*	SEQ *-ka* *-ek* FUT *-o*				+NV	
Boiken		∅	*-ɨn* *-nə*	DS		MarkSu +DS		

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Iatmul		SEQ *-laa* *-yəkiylaa* *-lampilaa* *-ləviylaa* SIM *-simpla* *-simplalaa* *-kiva*	∅	SS/DS				
Manambu, Sawos, Buiamanambu, Yelogu, Ngala: no information available								
Sepik Hills family (East Sepik)								
Alamblak		*-hate*	*-t*	DS		DS +MarkSu		
Bahinemo Sanio Hewa		no SS/DS						
Kaningra, Kapriman, Watakataui, Sumariup, Bisis, Mari, Bitara, Setiali, Paka, Gabiano, Piame, Bikaru: no information available								
Oksapmin family isolate (East Sepik)								
Oksapmin		∅	∅	SS/DS				
Grass family (East Sepik)								
Botin (Kambot)		NONFUT *-il* FUT *-in*	NONFUT *-al* FUT *-iten*					
Gorovu, Adjora, Aion: no information available								

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Engan family (Enga)								
Enga		SEQ *-(a)la* SIM *-o*	*-pa*	DS		MarkSu +DS		
Kewa		SEQ 'ego' *-a* SEQ 'alto' *-wa* SIM 'ego' *-ri* SIM 'alto' *-ma*	∅	DS†			+NV	
Mendi, Ipili, Bisorio, Sau, Huli: no information available								
Chimbu family (Chimbu)								
Kuman-Dom								
Kuman	MV1	SEQ *-tire≈-dire* SIM ∅	*-go* *-ko*	DS		MarkSu +DS		
	MV2	no SS/DS						
Dom: no information available								
Marigl dialects								
Golin		no SS/DS						
Salt-Yui		∅	∅	DS				
Chuave	MV1	*-re* *-ro* *-do*	*-goro*	DS		MarkSu +DS		
	MV2	no SS/DS						

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Wahgi		∅	*-nge* *-e* *-i*	SS/DS		MarkSu +DS		
Nii		∅	∅	SS/DS†				
Maring		∅	*-k*	DS		MarkSu +DS		
Sinasina		no SS/DS						
Hagen dialects								
Medlpa		SIM *-mel*	∅	SS/DS†				
Kaugel (Gawigl)		*-lie* *-li*	∅	SS/DS†				
Kandawo		*-o*	∅	SS/DS		MarkSu +SS		
Nagane, Narak: no information available								
Gorokan family (Eastern Highlands)								
Gende		*-ko* ≈ *-ki*	*-go*	SS/DS†		MarkSu +SS/DS		
Siane		*-to*	*-ito*	DS		MarkSu +DS		
Yabiyufa: no information available								
Gahuku-Asaro								
Gahuku		*-ke*	∅	SS/DS†				
Asaro: no information available								
Benabena		*-to* *-te*	*-go*	SS/DS	SS/DS	SS/DS +AnticSu		

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Kamano-Yagaria								
Kamano		∅	*-ke*	DS	DS	MarkSu +DS +AnticSu		
Kanite		∅	*-ke*	SS/DS	DS	MarkSu +DS +AnticSu		
Yagaria		∅	*-ga* *-aga*	DS	SS/DS	MarkSu +DS +AnticSu		
Hua	MV1	∅	*-ga*	(DS)	SS/DS	MarkSu/DS +AnticSu		
	MV2	no SS/DS						
Fore		*-nta* SEQ *-ma* SIM *-te*	∅	DS	SS/DS	SS/MarkSu +AnticSu		
Gimi	MV1	*-gatV*	*-gV*	SS/DS	DS	SS +MarkSu MarkSu +DS +AnticSu		
	MV2	SEQ *-me* *-mo* *-mete* SIM *-te* *-ta*						

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Kainantu family (Eastern Highlands)								
Gadsup-Agarabi								
Gadsup		*-e*	∅	DS	SS/DS	SS/MarkSu +AnticSu		
Agarabi	MV1	∅	∅	SS†/DS	DS	MarkSu +AnticSu		
	MV2	PURP *-nto*				MarkSu +AnticSu		
Auyana-Usarufa								
Usarufa		*-ma*	(*-ma*)	SS/DS	DS	MarkSu +AnticSu (*-ma*)		
Kosena		*-é*	∅	DS†	SS/DS	SS/MarkSu +AnticSu		
Tairora		*-ro*	∅	DS	DS	MarkSu +AnticSu		
Awa		∅	∅	SS/DS	SS/DS	MarkSu +AnticSu		
Binumarien				?SS/DS	?SS/DS			
Waffa		∅	∅	SS/DS†	SS/DS			
Owena: no information available								
Banaro family isolate (Madang)								
Banaro		*-ko*	∅					
Atan family (Madang)								
Nend (Angaua)		*-e*	∅	DS†				DS+SS
Atemple: no information available								

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Emuan family (Madang)								
Apali (Emerum)		*-vila*	∅	DS†				DS+SS
Musak: no information available								
Kalam family (Madang)								
Kalam		PFV *-y* IMPV *-l*	*-k*					
Kobon	MV1	∅	∅	SS/DS†				
	MV2	PURP *-nig*						
Gants: no information available								
Kumilan family (Madang)								
Mauwake (Ulingan)		SEQ *-ap* SIM *-am≈-ami*	∅	DS†				
Bepour, Moere: no information available								

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Numugenan family (Madang)								
Usan (Wanuma)	MV1	*-et* *-at* *-ot* *-âb* *-ub* ∅	∅	DS†				
	MV2	PURP *-ib* *-ub*	PURP *-ine*					
Yaben, Yarawata, Bilakura, Parawen, Ukuriguma: no information available								
Kowan family (Madang)								
Waskia		∅ (*se*) *ale*	*se*					
Korak: no information available								
Bargam family isolate (Madang)								
Bargam (Mugil)		SEQ *-im* SIM *-ad* IRR *-eq*	SEQ *-an* SIM *-sa* IRR *-id*					
Hanseman family (Madang)								
Nobonob (Garuh)		∅	∅	SS/DS†				
Rapting, Wamas, Samosa, Murupi, Saruga, Nake, Mosimo, Garus, Yoidik, Rempi, Bagupi, Silopi, Utu, Mewan, Baimak, Matepi, Gal, Kamba: no information available								

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Gum family (Madang)								
Amele		SEQ *-me*	SEQ *-ʔV*	SS/DS		SS/DS +MarkSu		
Panim		SEQ *-me*	SEQ *-wV*	SS/DS		SS/DS +MarkSu		
Isebe		SEQ *-meʔ*	SEQ *-an*	SS/DS		MarkSu +SS/DS		
Gumalu		SEQ *-faʔ*	SEQ *-an*	SS/DS		MarkSu +SS/DS		
Bau		SEQ NONFUT *-ho* FUT *-fa*	SEQ *-wV* SIM *-ʔan*	SS/DS		MarkSu +SS		
Sihan		*-ha*	*-wV*	SS/DS		MarkSu +SS DS +MarkSu		
Kokon family (Madang)								
Girawa		SEQ *-moi* *-ia(nik)*	SEQ *-nuk* SIM *-ta* *-na*					
Munit, Bemal: no information available								

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Belan Austronesian sub-family (Madang)								
Dami (Ham)		*-pen≈-ken* *-ma*	*-di*					
Mindjim family (Madang)								
Anjam (Bom)		*-si*	∅	SS/DS		SS/DS +MarkSu		
Male, Bongu, Songum: no information available								
Nuru family (Madang)								
Erima		∅	*-nga*	SS/DS†		MarkSu +DS		
Usu, Duduela, Kwato, Rerau, Jilim, Yangulam: no information available								
Kabenau family (Madang)								
Siroi		*-a* *-mba* *-sulumba*	*le*					
Arawum, Kolom, Lemio, Pulabu: no information available								
Evapia family (Madang)								
Koromu (Kesawai)		*-pe*	SEQ *-nate* PAST *-te* NONPAST *-ne*	DS†		MarkSu +DS		
Sinsauru, Asas, Sausi, Dumpu: no information available								

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Brahman group (Madang)								
Tauya		*-pa*	*-te* *-fe* *-tefe*	DS		MarkSu +DS		
Isabi, Biyom, Faita: no information available								
Gusap-Mot family (Madang - Morobe)								
Rawa		*-ro* *-ya*	*-too* *-to*	DS		DS +MarkSu		
Ngaing, Naru, Gira, Neko, Nekgini: no information available								
Yupna family (Madang - Morobe)								
Yupna (Kewieng)		SEQ *-ŋ*≈∅ SIM *-eek*	∅	DS†				DS+SS
Nankina		*-ŋ*	∅	DS†				
Gabutamon, Domung, Bonkiman, Wandabong, Isan, Nokopo, Mebu: no information available								
West Huon family (Morobe)								
Burum		*-ba*≈*-da* ≈*-a*	*-ga*≈*-gu*	DS†		MarkSu +DS		
Komba		*-m*	∅	DS†				
Nabak		*-ti*	*-ma*	DS†		DS +MarkSu		
Ono		∅	∅	DS†				
Selepet		*-m*	*-mu*	DS†		DS +MarkSu		

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Timbe		SEQ *-mâ* SIM *-eine*	∅	DS†				
Sialum, Nomu, Kinalakna, Kumukio, Tobo, Yaknge, Kosorong, Momolili: no information available								
East Huon family (Morobe)								
Kâte		∅	∅	DS†				
Kube		*-ma*	∅	DS				
Dedua		*-ma*	*-de*	DS		MarkSu +DS		
Mape, Sene, Momave, Migabac: no information available								
Wantoat family (Morobe)								
Wantoat		∅	*-wa*	DS				
Irumu		SEQ *-päŋ* *-peŋ* SIM *-kaŋ* *-maŋ* *-täŋ*	∅	DS†				DS+SS
Awara, Leron, Saseng, Bam, Yagawak: no information available								
Erap family (Morobe)								
Uri		*-aŋa*	*-iŋa*					
Nek		has SS/DS						
Mamaa, Finungwan, Gusan, Nimi, Sauk, Numanggang, Nakama, Nuk, Munkip: no information available								
Kovai family isolate (Morobe)								
Kovai		*-ai*	∅	DS				

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Uruwa family (Morobe)								
Yau		*-g*	∅	DS†				DS+SS
Komutu, Sakam, Som, Weliki: no information available								
Binandarean family (Oro)								
Suena		∅	∅	SS/DS				
Zia		∅	∅	SS/DS				
Orokaiva		SEQ DUR *-ma* PUNC *-to* SIM *-e*	∅	DS				
Korafe		∅	∅	SS/DS				
Binandere		∅	*-o*	DS		MarkSu +DS		
Guhu-Samane (Mid-Waria)		*-qi*	*-mi*					
Yekora, Ambasi, Aeka, Hunjara, Notu, Yega, Gaina, Baruga, Dogoro: no information available								
Angan family (Gulf - Morobe)								
Baruya	MV1	*-a(no)*	*ka-*	SS/DS		MarkSu +SS DS +MarkSu		
	MV2 RC	*-e*						

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Wojokeso (Ampale)		∅	*-ŋingk*	SS/DS†		DS +MarkSu		
Angave		*ni-*	∅	DS†		SS +MarkSu		
Menya		∅	*-aaŋg*	SS/DS†		DS +MarkSu		
Kapau		*n-* *na-*	*-ti* *-ta*	SS/DS		SS +MarkSu MarkSu +DS		
Angaataha		∅	*-hi*	SS/DS†		MarkSu +DS		
Akoye (Lohiki)		SEQ *-iyä* *-m* SIM *-a*	SEQ *-an* SIM *-a*	SS				
Tainae (Kukukuku)		∅	*-a(k)*	SS/DS		MarkSu +DS		
Simbari, Kawacha, Kamasa, Yogwoia, Ivori: no information available								

Goilalan family (Central, Morobe, Oro)								
Weri		*-ak* *-kaim* ∅	*-ën*					
Biangai		no SS/DS						

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Kunimaipa	MV1	*-puho*	*-na*	SS/DS		MarkSu +SS/DS		
	MV2	SEQ *-ta* SIM *-vai*						
Tauade		*-ua*	∅	DS†				
Fuyuge: Ray (1912) not available								
Koiarian family (Central, Oro)								
Koiari		*-me*	*-ge*					
Koita		*-ɨ(me)* *-anera*	*-ge*					
Mt. Koiali	MV1	*-i* *-ale*	*-ge*					
	MV2	*-ike* *-ime*	*-ge*					
Barai		*-gana* SEQ *-na* SIM *-kinu*	*-ga* SEQ *-mo* *-moga* SIM *-ko* *-koga*					
Ömie	MV1	SEQ *-romo* SIM *-'irô*	*-go*					
	MV2	PURP *-ëro*	PURP *-jöro*					
Managalasi		*-Ne* *-i'i*	*-ume*					

Language	MV types	SS Mark	DS Mark	MarkSu	AnticSu	Order	Non-verb	DS+SS
Dagan family (Central)								
Daga		∅	*-wa* *-amba*	SS/DS†		MarkSu +DS		
Kanasi		*-e*	*-o*					
Mapena, Gwedena, Ginuman, Sona, Jimajima, Maiwa, Onjob: no information available								
Yareban family (Central)								
Yareba		*-te*	*-ro*	SS/DS		MarkSu +SS/DS		
Abia, Doriri, Bariji: no information available								
Rotokas family (Bougainville)								
Rotokas		SEQ *-(vo)iva* SIM *-oro*	∅	DS				
Eivo: no information available								
S. Bougainville family (Bougainville)								
Nasioi		SEQ *-kotaa?* *-ta* SIM *-itaa?* *-ma*	SEQ *-io?* SIM *-ko*					
Nagovisi		SEQ *-ra* SIM *-koroo* *-ma*	SEQ/SIM *-ko* SIM *-io*					
Buin		*-mo*	*-gu*					
Siwai: no information available								

KEY TO APPENDIX 1

MV types	Different medial verb types
SS mark	Same subject marker
DS mark	Different subject marker
MarkSu	Subject agreement for the subject of the marked verb
AnticSu	Anticipatory subject agreement for the subject of the following verb
Order	Linear order of SS/DS markers, subject agreement markers and anticipatory subject markers if they all occur as analysable morphemes
Non-verb	If the SS/DS morphology can be attached to some item other than a verb
DS+SS	Marking of both DS and SS morphology on the same verb
†	Indicates MarkSu = Nonfinal form.

APPENDIX 2: GRAMMATICAL CATEGORIES ASSOCIATED WITH SS/DS

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
Ok family (Western) - Mountain							
Telefol	SS/DS						
Mianmin	DS						
Tifal	SS/DS						
E. Strickland family (Southern Highlands)							
Samo	SS/DS		DS (fut, nonfut)				
Inland Gulf family							
Kamula	SS/DS						
West Kutubuan family							
Fasu	SS/DS				SS/DS		
Teberan family							
Podopa							
Yuri family isolate (West Sepik)							
Karkar-Yuri							
Senagi family (West Sepik)							
Anggor	DS						
Baibai family (West Sepik)							
Nai (Biaka)	SS/DS						

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
Nukuma family (East Sepik)							
Washkuk (Kwoma)	SS		DS (past, pres, fut)		SS/DS	SS/DS	
Kwanga							
Ndu family (East Sepik)							
Ambulas (Abelam)	SS/DS		DS (fut, nonfut)		SS/DS	DS	
Boiken			DS (fut, nonfut)				
Iatmul		SS	SS (fut, nonfut)		SS	SS	
Sepik Hills family (East Sepik)							
Alamblak							–PERSON –NUMBER
Oksapmin family isolate (East Sepik)							
Oksapmin	SS/DS						
Grass family (East Sepik)							
Botin (Kambot)			SS/DS (fut, nonfut)				
Engan family (Enga)							
Enga	SS		DS (past, pres, fut)				
Kewa	SS						+PERSON –NUMBER

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
Chimbu family (Chimbu)							
Kuman	SS/DS						
Salt-Yui				SS/DS		DS	
Chuave							
Wahgi			DS (past, nonpast)			DS	
Nii							
Maring							
Medlpa	SS						
Kaugel (Gawigl)	SS						
Kandawo							
Gorokan family (Eastern Highlands)							
Gende			DS (fut, nonfut)				
Siane							
Gahuku		SS/DS (PROG)	SS/DS (fut, nonfut)				
Benabena	SS/DS						
Kamano-Yagaria							
Kamano	SS/DS	SS/DS	SS/DS (fut, nonfut)				
Kanite	SS/DS	SS/DS					
Yagaria	SS/DS		DS (fut, nonfut)				
Hua			DS (fut, nonfut)			SS/DS	

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
Fore	SS		DS (past, pres, fut)				
Gimi	SS						
Kainantu family (Eastern Highlands)							
Gadsup-Agarabi							
Gadsup							
Agarabi	SS/DS				SS	SS/DS	
Auyana-Usarufa							
Usarufa							
Kosena	DS		DS (past, pres, fut)			SS/DS	
Tairora	SS/DS	SS (PROG)	SS/DS (fut, nonfut)				
Awa	SS/DS		SS/DS (fut, nonfut)			DS	
Binumarien							
Waffa	SS/DS						
Banaro family isolate (Madang)							
Banaro	SS/DS						
Atan family (Madang)							
Nend (Angaua)				SS/DS			+PERSON −NUMBER
Emuan family (Madang)							
Apali (Emerum)							

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
Kalam family (Madang)							
Kalam							
Kobon	SS				SS		+PERSON –NUMBER
Kumilan family (Madang)							
Mauwake (Ulingan)	SS						
Numugenan family (Madang)							
Usan (Wanuma)					SS/DS	SS	+PERSON –NUMBER
Kowan family (Madang)							
Waskia							+PERSON –NUMBER
Bargam family isolate (Madang)							
Bargam (Mugil)	SS/DS			SS/DS		SS/DS	–PERSON –NUMBER
Hanseman family (Madang)							
Nobonob (Garuh)	SS/DS			DS			–PERSON +NUMBER

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
Gum family (Madang)							
Amele	SS/DS	SS/DS		DS	SS/DS	SS	–PERSON +NUMBER
Panim	SS/DS					SS	
Isebe	SS/DS					SS	
Gumalu	SS/DS					SS	
Bau	SS/DS		SS (fut, nonfut)			SS	
Sihan	SS/DS					SS	
Kokon family (Madang)							
Girawa	SS/DS						
Belan Austronesian sub-family (Madang)							
Dami (Ham)							
Mindjim family (Madang)							
Anjam (Bom)	SS/DS			SS/DS			
Nuru family (Madang)							
Erima	SS/DS		DS (past, pres, fut)	SS			
Kabenau family (Madang)							
Siroi							

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
Evapia family (Madang)							
Koromu (Kesawai)	DS		DS (past, nonpast)				
Brahman group (Madang)							
Tauya			DS (fut, nonfut)				
Gusap-Mot family (Madang - Morobe)							
Rawa							
Yupna family (Madang - Morobe)							
Kewieng	SS/DS		DS (past, pres, fut)				–PERSON +NUMBER
Nankina	SS/DS	SS/DS (+PROG)					–PERSON –NUMBER
West Huon family (Morobe)							
Burum	DS						
Komba		SS/DS					
Nabak		SS/DS					
Ono	SS/DS	SS/DS					–PERSON +NUMBER
Selepet	SS	SS					
Timbe	SS						

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
East Huon family (Morobe)							
Kâte	SS/DS	SS/DS					
Kube	SS/DS	SS/DS					
Dedua	DS						
Wantoat family (Morobe)							
Wantoat	SS/DS	SS/DS					
Irumu	SS/DS						–PERSON –NUMBER
Erap family (Morobe)							
Uri		SS/DS					
Kovai family isolate (Morobe)							
Kovai							
Uruwa family (Morobe)							
Yau							–PERSON +NUMBER
Binandarean family (Oro)							
Suena	SS/DS	SS/DS	SS/DS (past, pres, fut)		SS		–PERSON +NUMBER
Zia	SS/DS	SS/DS	SS/DS (past, pres, fut)				

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
Orokaiva	SS	SS					
Korafe	SS/DS	SS/DS					
Binandere	SS		SS (past, pres, fut)				
Guhu-Samane							
Angan family (Gulf - Morobe)							
Baruya	SS/DS						
Wojokeso (Ampale)	DS			SS/DS			
Angave	DS						–PERSON –NUMBER
Menya						SS	
Kapau	SS	SS	SS (fut, nonfut) DS (past, pres, fut)				
Angaataha	SS			DS			
Akoye (Lohiki)	SS/DS	SS	DS (past, fut)			DS	
Tainae (Kukukuku)	SS/DS		DS (past, fut)				
Goilalan family (Central, Morobe, Oro)							
Weri							
Kunimaipa	SS/DS				SS	SS	
Tauade	SS/DS	SS/DS		DS	SS/DS	DS	

Language	SEQ/SIM	DUR/PUNC	TENSE	REAL/IRR	PURP	COND	PERS/NUM
Koiarian family (**Central,** Oro)							
Koiari							
Koita	SS		SS/DS (past, pres, fut)			SS/DS	
Mt Koiali	SS/DS						
Barai	SS/DS		SS/DS (fut, nonfut)			SS/DS	
Ömie	SS				SS/DS		–PERSON +NUMBER
Managalasi	SS/DS						
Dagan family (Central-Milne Bay)							
Daga		SS/DS	SS/DS (past, pres, fut)			SS/DS	
Kanasi			SS/DS (past, pres, fut)				
Yareban family (Central-Oro)							
Yareba	SS/DS						
Rotokas family (Bougainville)							
Rotokas	SS						
S. Bougainville family (North Solomons)							
Nasioi	SS/DS	SS					
Nagovisi	SS/DS						
Buin							

KEY TO APPENDIX 2

SEQ/SIM	sequential vs. simultaneous relative tense
DUR/PUNC	durative vs. punctiliar aspect
TENSE	absolute tense distinctions
REAL/IRR	realis vs. irrealis modality
PURP	purpose clause
COND	conditional clause
PERS/NUM	person and/or number control over referential overlap

APPENDIX 3: ALPHABETICAL LIST OF LANGUAGES CITED

Language	±SR	Family	Location	Sources
Abau	+SR	Upper Sepik	E. Sepik	Laycock (1973), Lock and Lock (1986)
Agarabi	+SR	Kainantu	E. Highlands	Goddard (1974, 1980)
Akoye (Lohiki)	+SR	Angan	Gulf	Whitney (1991)
Alamblak	+SR	Sepik Hills	E. Sepik	Bruce (1979, 1984, 1986)
Ama	–SR	Arai (Left May)	W. Sepik	Årsjö and Årsjö (1975)
Amaimon family	?SR		Madang	Z'graggen (1975)
Amanab	–SR	Waris	W. Sepik	Minch (1992)
Ambulas (Abelam)	+SR	Ndu	E. Sepik	Wilson, P.R. (1973, 1980)
Amele	+SR	Gum	Madang	Wullenkord (1928, circa 1930), Roberts (1986, 1987, 1988a, 1988b, 1990, 1991a, 1991b, 1991c, 1992a, 1992b, 1992c, 1993a, 1993b, 1993c, 1994, forthcoming), Anderson and Roberts (1991)
Amto-Musian family	?SR		W.-E. Sepik	Laycock (1973)
Angaataha	+SR	Angan	Morobe	Huisman (1973, 1981)
Angave	+SR	Angan	Gulf	Speece (1985)
Anggor	+SR	Senagi	W. Sepik	Litteral, S. (1972), Litteral, R. (1980)
Anjam (Bom)	+SR	Mindjim	Madang	Rucker (1983)
Annaberg family	?SR		Madang	Z'graggen (1975)
Apali	+SR	Emerum	Madang	Wade (1989)
Arafundi family	?SR		E. Sepik	Laycock (1973)
Ata	–SR	E. Papuan isolate	E. New Britain	Hashimoto (1991)
Au	–SR	Torricelli	W. Sepik	Scorza (1974, 1985)
Awa	+SR	Kainantu	E. Highlands	Loving (1973)
Awtuw	–SR	Ram	W. Sepik	Feldman (1986)
Bahenimo	–SR	Sepik Hills	E. Sepik	Dye and Dye (1967)
Banaro	+SR	isolate	Madang	Butler (1981)
Barai	+SR	Koiarian	Milne Bay	Olson (1973, 1975, 1978, 1981)
Bargam (Mugil)	+SR	isolate	Madang	Hepner (1986)
Baruya	+SR	Angan	Morobe	Lloyd (1984, 1992)
Bau (Fulumu)	+SR	Gum	Madang	Roberts (1993b)
Begua	–SR	Marind	Western	Voorhoeve (1970a)
Benabena	+SR	Gorokan	E. Highlands	Young (1971)

Language	±SR	Family	Location	Sources
Biangai	–SR	Goilalan	Morobe	Dubert and Dubert (1978)
Biksi	?SR	isolate	W. Sepik	Laycock (1973)
Binandere	+SR	Binandarean	Morobe	Capell (1969)
Bine	–SR	East-Trans Fly	Western	Fleischmann and Turpeinen (1975)
Binumarien	+SR	Kainantu	E. Highlands	Oatridge (1966)
Boazi	–SR	Marind	Western	Voorhoeve (1970a)
Boiken	+SR	Ndu	E. Sepik	Z'graggen (1977), Freudenburg (1979)
Botin (Kambot)	+SR	Grass	E. Sepik	Pryor and Farr (1989), Pryor (1990)
Buin	+SR	S. B'ville	N. Solomons	Longacre (1972), Vaughan (1977)
Burum	+SR	W. Huon	Morobe	Olkkonen and Olkkonen (1983)
Busa	?SR	isolate	W. Sepik	Laycock (1973)
Chuave	+SR	Chimbu	Chimbu	Thurman (1975)
Dadibi	–SR	Teberan	Chimbu	MacDonald, G.E. (1976)
Daga	+SR	Dagan	Milne Bay	Murane (1974)
Dami (Ham)	+SR	Belan (Aust)	Madang	Elliot (1979)
Dani, Lower Grand Valley	+SR	Dani	Irian Jaya	Bromley (1981)
Dedua	+SR	E. Huon	Morobe	Ceder and Ceder (1989)
Dimir family	?SR		Madang	Z'graggen (1975)
Enga	+SR	Engan	Enga	Lang (1975), Li and Lang (1979)
Erima	+SR	Nuru	Madang	Colburn (1981)
Faiwol	–SR	Ok	Western	Mecklenburg Mecklenburg (1969, 1970, 1977)
Fas	–SR	Kwomtari	W. Sepik	Baron (1987)
Fasu	+SR	West Kutubuan	S. Highlands	Loeweke and May (1980)
Fore	+SR	Gorokan	E. Highlands	Longacre (1972), Scott (1973, 1978, 1983)
Gadsup	+SR	Kainantu	E. Highlands	Frantz and McKaughan (1973)
Gahuku	+SR	Gorokan	E. Highlands	Longacre (1972), Deibler (1976)
Gende	+SR	Gorokan	E. Highlands	Aufenanger (1952)
Gimi	+SR	Gorokan	E. Highlands	McBride and McBride (1973)
Girawa	+SR	Kokon	Madang	Gasaway and Sims (1977), Lillie (1987, 1989, 1992)
Goam stock	?SR(+SR)		Madang	Z'graggen (1975)
Gogodala	–SR	Gogodala-Suki	Western	Voorhoeve (1970b)
Golin	–SR	Chimbu	E. Highlands	Longacre (1972), Bunn (1974)
Guhu-Samane	+SR	Binandarean	Morobe	Richert (1975)

Language	±SR	Family	Location	Sources
Gumalu	+SR	Gum	Madang	Roberts (1993b)
Haruai	+SR	Piawi	Madang	Comrie (1988, 1989)
Hewa	–SR	Sepik Hills	S. Highlands	Vollrath (1981)
Hua	+SR	Gorokan	E. Highlands	Haiman (1978, 1980, 1987, 1991)
Iatmul	+SR	Ndu	E. Sepik	Staalsen (1972)
Imonda	–SR	Waris	W. Sepik	Seiler (1985, 1986)
Inland Gulf family	?SR		Gulf	Franklin (1973)
Irumu	+SR	Wantoat	Morobe	Webb and Webb (1988), Roberts (1988b)
Isebe	+SR	Gum	Madang	Roberts (1993b)
Iwam	–SR	Upper Sepik	E. Sepik	Conrad (1965), Laycock (1973), Laszlo, Conrad and Hunney (1981)
Josephstaal stock	?SR		Madang	Z'graggen (1975)
Kalam	+SR	Kalam	Madang	Pawley (1966, 1987)
Kamano	+SR	Gorokan	E. Highlands	Payne and Drew (1966), Drew and Payne (1969)
Kamasau	–SR	Torricelli	E. Sepik	Sanders (1978)
Kamula	+SR	Inland Gulf	Western	Routamaa (1993)
Kanasi	+SR	Dagan	Central	Royer and Royer (1990)
Kandawo	+SR	Chimbu	W. Highlands	Graham (1991)
Kanite	+SR	Gorokan	E. Highlands	McCarthy (1965), Longacre (1972)
Kapau	+SR	Angan	Morobe	Oates and Oates (1968)
Kare family	?SR		Madang	Z'graggen (1975)
Karkar-Yuri	+SR	isolate	W. Sepik	Laycock (1973), Rigden (1986)
Kâte	+SR	E. Huon	Morobe	Pilhofer (1933), McElhanon (1973)
Kaugel (Gawigl)	+SR	Chimbu	W. Highlands	Blowers and Blowers (1970), Head (1990)
Kaukombaran family	?SR		Madang	Z'graggen (1975)
Kewa West	+SR	Engan	S. Highlands	Franklin (1965, 1971, 1983)
Kewieng	+SR	Yupna	Morobe	McElhanon (1973), Reed (1989)
Kiwai family	–SR		Western	Ray (1933), Wurm (1973)
Kobon	+SR	Kalam	Madang	Dawson and Dawson (1974), Davies (1981)
Koiari	+SR	Koirari	Central	Dutton (1969)
Koita	+SR	Koirari	Central	Dutton (1975)
Kol	–SR	E. Papuan isolate	E. New Britain	Lindrud (1982)
Komba	+SR	E. Huon	Morobe	Southwell (1979)
Korafe	+SR	Binandarean	Oro	Farr and Farr (1975), Farr (1992)

Language	±SR	Family	Location	Sources
Koromu (Kesawai)	+SR	Evapia	Madang	Priestly (1980, 1986)
Kosena	+SR	Kainantu	E. Highlands	Marks (1970), Longacre (1972)
Kovai	+SR	isolate	Morobe	McElhanon (1973)
Kube	+SR	E. Huon	Morobe	McElhanon (1973)
Kuini	–SR	Marind	Western	Voorhoeve (1970a)
Kuman	+SR	Chimbu	Chimbu	Bergman (1953), Trefry (1969), Piau (1981-2, 1985)
Kunimaipa	+SR	Goilalan	Morobe	Longacre (1972), Geary (1977)
Kwanga	+SR	Nukuma	E. Sepik	Manabe and Manabe (1979)
Leonhard Schultze family	?SR		W. Sepik	Laycock (1973)
Mabuan family	?SR		Madang	Z'graggen (1975)
Managalasi	+SR	Koiarian	Oro	Parlier (1964), Longacre (1972)
Marind	–SR	Marind	Western	Drabbe (1955), Boelaars (1950)
Maring	+SR	Chimbu	Chimbu	Woodward (1973)
Mauwake (Ulingan)	+SR	Kumilan	Madang	Kwan (1980)
Medlpa	+SR	Chimbu	Chimbu	Straus (n.d.)
Menya	+SR	Angan	Morobe	Whitehead (1986, 1992)
Mianmin	+SR	Ok	W. Sepik	Smith and Weston (1974)
Mongol-Langam family	?SR		E. Sepik	Laycock (1973)
Monumbo	–SR	Torricelli	Madang	Vormann and Scharfenberger (1914)
Mt. Arapesh	–SR	Torricelli	W. Sepik	Fortune (1942), Gerstner (1963)
Mt. Koiali	+SR	Koirari	Central	Garland (1980), Garland and Garland (1975)
Murik	–SR	Nor	E. Sepik	Schmidt (1953), Abbott (1978), Abbott and Abbott (1978)
Nabak	+SR	E. Huon	Morobe	McElhanon (1973)
Nagatman	?SR	isolate	W. Sepik	Laycock (1973)
Nagovisi	+SR	S. B'ville	Bougainville	Decker (1981)
Nai (Biaka)	+SR	Baibai	W. Sepik	Hamlin and Hamlin (1989)
Namie	–SR	Yellow River	W. Sepik	Feldpausch and Feldpausch (1992)
Nankina	+SR	Yupna	Madang	Spaulding (1988)
Nasioi	+SR	S. B'ville	Bougainville	Hurd (1970), Longacre (1972)
Nek	+SR	Erap	Morobe	Linnasalo (1990)
Nend	+SR	Atan	Madang	Harris (1990)
Nii	+SR	Chimbu	Chimbu	Longacre (1972), Stucky (1974)

Language	±SR	Family	Location	Sources
Nobonob (Garuh)	+SR	Hanseman	Madang	Aeschliman and Aeschliman (1979, 1988)
Oksapmin	+SR	isolate	W. Sepik	Lawrence (1972)
Olo	–SR	Torricelli	W. Sepik	McGregor (1982)
Ömie	+SR	Koirari	Oro	Austing and Upia (1975), Austing and Austing (1977)
Omosan family	?SR		Madang	Z'graggen (1975)
Ono	+SR	W. Huon	Morobe	Wacke (1931), McElhanon (1973), Phinnemore (1988)
Opao (Sepoe)	–SR	Eleman	Gulf	Brown, H.A. (1973)
Orokaiva	+SR	Binandarean	Morobe	Healey et al. (1969), Larson (1977)
Orokolo	–SR	Eleman	Gulf	Brown, H.A. (1973)
Paiawan	–SR	isolate	Gulf	Trefry (1969)
Panim	+SR	Gum	Madang	Roberts (1993b)
Paynamar family	?SR		Madang	Z'graggen (1975)
Peka family	?SR		Madang	Z'graggen (1975)
Podopa	+SR	Teberan	Gulf	Anderson and Anderson (1976), Anderson and Wade (1988), Reesink (1991)
Rawa	+SR	Gusap-Mot	Madang	McElhanon (1973), Toland (1988)
Rotokas	–SR	Rotokas	Bougainville	Firchow (n.d., 1987)
Rumu	–SR	Turama-Kikorian	Gulf	Petterson (1986)
Ruboni	?SR(+SR)		Madang	Z'graggen (1975)
Salt-Yui	+SR	Chimbu	Chimbu	Irwin (1974)
Samo	+SR	E. Strickland	Western	Shaw (1973, 1986)
Sanio	–SR	Sepik Hills	E. Sepik	Lewis and Lewis (1972)
Selepet	+SR	E. Huon	Morobe	McElhanon (1970b, 1972)
Siane	+SR	Chimbu	Chimbu	James (n.d, 1970, 1983), Potts and James (1988)
Sihan	+SR	Gum	Madang	Roberts (1993b)
Sinasina	–SR	Chimbu	Chimbu	McVinney and Luzbetak (1954)
Siroi	+SR	Kabenau	Madang	Wells (1979), van Kleef (1989), van Kleef and van Kleef (1988)
Sko	–SR	Sko	W. Sepik	Voorhoeve (1971)
S. Arapesh	–SR	Torricelli	W. Sepik	Alungun et al. (1978)
Suki	–SR	Gogodala-Suki	Western	Voorhoeve (1970b)
Suena	+SR	Binandarean	Morobe	Wilson (1969b, 1974)
Tainae (Kukukuku)	+SR	Angan	Gulf	Carlson (1991)

Language	±SR	Family	Location	Sources
Tairora	+SR	Kainantu	E. Highlands	Vincent and Vincent (1962), McKaughan (1966)
Tauade	+SR	Goilalan	Central	Stutzman (1990)
Tauya	+SR	Brahman	Madang	MacDonald, L. (1983)
Telefol	+SR	Ok	W. Sepik	Healey (1965a, 1965b, 1966)
Tiboran family	?SR		Madang	Z'graggen (1975)
Tifal	+SR	Ok	W. Sepik	Boush (1975)
Timbe	+SR	W. Huon	Morobe	Foster (1972, 1981)
Toaripi	–SR	Eleman	Gulf	Brown, H.A. (1973)
Turama-Kikorian family	–SR		Gulf	Franklin (1973)
Uri	+SR	Erap	Morobe	Webb and Webb (1980)
Usan (Wanuma)	+SR	Numugenan	Madang	Reesink (1983, 1984)
Usarufa	+SR	Kainantu	E. Highlands	Bee (1973)
Valman	–SR	Torricelli	W. Sepik	Schmidt and Vormann (1900), Spölgen and Schmidt (1901), Klaffl and Vormann (1905)
Vanimo	–SR	Sko	W. Sepik	Ross (1980)
Waffa	+SR	Kainantu	E. Highlands	Hotz and Stringer (1969)
Wahgi	+SR	Chimbu	Chimbu	Phillips (1968, 1976)
Wantoat	+SR	Wantoat	Morobe	Davis (1964)
Waris	–SR	Waris	W. Sepik	Brown, R. (1981, 1988, 1990)
Warup family	?SR		Madang	Z'graggen (1975)
Washkuk (Kwoma)	+SR	Nukuma	E. Sepik	Kooyers (1974, 1975)
Waskia	+SR	Kowan	Madang	Ross and Paol (1978)
Weri	+SR	Goilalan	Morobe	Boxwell and Boxwell (1980)
Wogamusin	?SR	Upper Sepik	E. Sepik	Laycock (1973)
Wojokeso (Ampale)	+SR	Angan	Morobe	Longacre (1972), West (1973)
Yaganon family	?SR		Madang	Z'graggen (1975)
Yagaria	+SR	Gorokan	E. Highlands	Renck (1975)
Yareba	+SR	Yareban	Oro	Weimer (1975)
Yau	+SR	Uruwa	Morobe	Lauver and Wegmann (1990)
Yele	–SR	isolate	Milne Bay	Henderson (1975), Henderson and Henderson (1979)
Yessan-Mayo	–SR	Tama	E. Sepik	Longacre (1972), Foreman (1974)
Yimas	–SR	Pondo	E. Sepik	Foley (1986, 1991)
Yuat family	?SR		E. Sepik	Laycock (1973)

Language	±SR	Family	Location	Sources
Zia	+SR	Binandarean	Morobe	Mailander (1928), Wilson (1969a)
Zimakani	–SR	Marind	Western	Voorhoeve (1970a)

SUMMARY

Total language families investigated:	51	
Total languages investigated:	169	
Total languages found with +SR:	122	(72%)
Total languages found with –SR:	47	(28%)
Total languages/language groups with ?SR:	24	

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ABBREVIATIONS

AIAS	Australian Institute of Aboriginal Studies
AL	*Anthropological Linguistics*
ANU	Australian National University
CUP	Cambridge University Press
LD, AP	*Language Data, Asian-Pacific Series*
Ling	*Linguistics*
LLM	*Language and Linguistics in Melanesia*
MBA	*Micro-Bibliotheca Anthropos*
OL	*Oceanic Linguistics*
PL	*Pacific Linguistics*
SIL	Summer Institute of Linguistics
SIL Pub	SIL Publications in linguistics and related fields
TSL	*Typological Studies in Language*
WPNGL	*Workpapers in Papua New Guinea Languages*
DPNGL	*Data Papers in Papua New Guinea Languages*

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